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AN ESSAY ON THE MALIGNANT
PESTILENTIAL FEVER
1801

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AN
E S S A Y
ON THE
MALIGNANT PESTILENTIAL FEVER,
INTRODUCED INTO
THE WEST INDIAN ISLANDS
FROM BOULLAM, ON THE COAST OF GUINEA,
AS IT APPEARED IN
1793, 1794, 1795, and 1796.

Interspersed with Observations and Facts, tending to prove that
the Epidemic existing at Philadelphia, New-York, &c.
was the same Fever introduced by Infection
imported from the West India Islands :

And illustrated by Evidences founded on the State of those Islands,
and the Information of the most eminent Practitioners
residing on them.

BY C. CHISHOLM, M. D.

AND INSPECTOR GENERAL OF THE ORDNANCE MEDICAL
DEPARTMENT IN THE WEST INDIES.

THE SECOND EDITION, MUCH ENLARGED.

Argento melius persolvunt omnia vivo
Par major : micula etenim vis insita in illo est :
(Sive quod id natum est subito frigisque caloremque
Excipere unde in se nostrum citò contrahit ignem,
Quodque est condensum, humores dissolvit, agitque
Fortius, ut candens ferrum flammâ acrius urit :
Sive cres unde, il constat compagine micula,
Particula: nexuque suo vincitque soluta:
Introrsum ut potuere scortum in corpora ferri)
Collequant c. creta, et semina: pestis irruiant. — *Fracastorii Syphilis.*

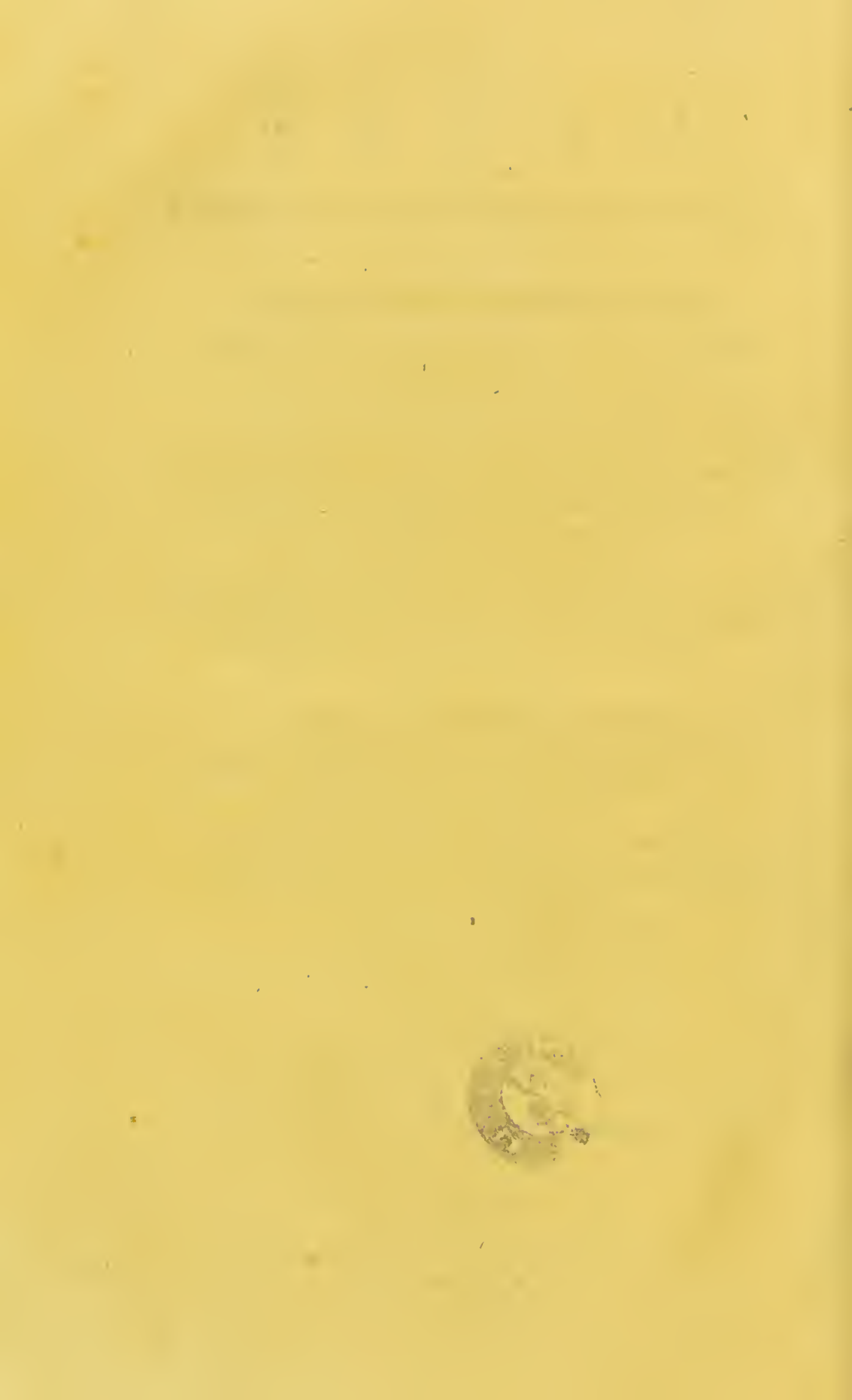
Quod me in hac re usus atque experientia docuit, palam eloqui, ac etiam propugnare
non verëbor. *Sydenham.*

VOL. I.

London:

PRINTED FOR J. MAWMAN, IN THE DOULTRY,
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1801.



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DEDICATION

TO THE
MEDICAL GENTLEMEN
OF
HIS MAJESTY'S
ARMY AND NAVY.



GENTLEMEN,

FIVE years have now elapsed, since I had the honour of addressing the first Edition of my Essay on the Malignant Pestilential Fever to you. In my address on that occasion, urged by a warm solicitude for the interests of humanity and of my country, I endeavoured to engage your attention to the circumstances of the history, cure, and prevention of a disease not inferior in malignity to the plague, and

not short in the extent of its devastation :
—what success I have had in this attempt is, of course, best known to yourselves :—it would be a source of infinite gratification to me, could I say it has been complete :—the world will, however, approve my motives, and justify the disinterestedness of my conduct. Be that as it may, during five years, employed in the exercise of my profession in a wide range of observation, I have witnessed nothing in the history, or treatment of that malady, which should induce me to alter the opinion I then presented to you. I therefore, consider it as a duty I owe my country, to again call your attention to the peculiar circumstances, which may render the result of your practice in the Malignant Pestilential Fever happy, or unfortunate.

With

With this view, and to place the subject in a still more clear light, I have extended the Work very considerably; and endeavoured by new facts, and reasoning, resulting from the consideration of them, to impress the necessity which exists for decision, dispassionate examination, and unwearied attention in the pursuit of the mercurial mode of treatment, which the almost universal suffrage of medical Gentleman, who have practised in this pestilential scourge within the tropics, has proved to be the most efficacious. It would have been with heart-felt satisfaction, could I have stated to you, that the West India navy and armies, since the publication of my Essay, had benefited by the practice recommended in that work. As a British subject, and as a friend to humanity, I

most sincerely regret they have not. But what has been the cause? Not the inefficacy of the mercurial treatment—Alas! no—but the baneful operation of determined prejudice—the bias of unjustifiable authority—the imbecility of weak or inexperienced minds, dreading the adoption of measures, which, although necessary for the preservation of the unhappy sick placed under their charge, militated against the opinions of misplaced and overweening power. Had a judicious and decisive practice been pursued, would more than twelve thousand of our countrymen have perished in the short space of two years?—Without enlarging on this question, I shall leave it to your serious consideration.

Permit me to assure you, Gentlemen, that, regardless of every power which
may

may attempt to thwart the benevolent purposes of this publication; independent of every interested view; and with a determination (which nothing but an eager desire to see my plan of treatment of the Malignant Pustulent Fever more firmly established, by a greater extension of observation in the torrid zone, has hitherto prevented me from executing) of retiring altogether from medical pursuits: I warmly solicit your careful attention to the practical part, more especially of the following Work; because I am convinced you will there find a tolerably safe guide, in the devious road of medical practice, in the most insidious and fatal disease our armies, and navies in the West Indies have ever suffered by. Hesitation is certainly productive of the most fatal consequences

in the Malignant Pestilential Fever; and a timid exhibition of the remedy adopted must be succeeded by disappointment. But should both these causes of failure be obviated; still little can be expected from the most appropriate treatment, if assiduous attention, and the exercise of benevolence to the helpless sufferers under your charge, are wanting. Every motive which can agitate a well constituted mind, calls upon you to exertion—honour, patriotism, humanity. With sentiments of respect and esteem, I am,

GENTLEMEN,

Your most obedient,

and very humble Servant,

C. CHISHOLM.

PREFACE

TO THE FIRST EDITION.

AN anxious wish to see the subject of the following sheets treated by an abler pen, has hitherto prevented the Author from offering the Public this feeble effort to promote their welfare. Finding, however, that nothing adequate to its importance has appeared; and being conscious of the possession of perhaps more extensive experience in the Malignant Pestilential Fever than has fallen to the lot of almost any practitioner in this country, he thinks it would be acting contrary to the principles of humanity, as well as the interest of the medical profession, should he delay any longer a publication, which indeed claims no other merit than truth with respect to the statement of facts, and novelty with respect to the mode of treatment found successful.

That the Malignant Pestilential Fever is no rare occurrence in cold climates, has been too fatally experienced. It is not so, however, in hot climates, if we may judge from the writings of

medical practitioners; for although symptoms of malignancy have appeared in the Yellow Fever of the country, in its advanced stage, seldom have those of pestilence shewn themselves; and never has contagion till now, rendered the usual precautions observed in Europe against the introduction of the Plague, necessary.

Perhaps the following consideration may constitute a further apology for the Author's intruding himself on the Public: It is evident that the most respectable writers on the Malignant Fever have found infinite difficulty in ascertaining an appropriate mode of cure: what but this are we to infer from the following passages: "I have observed before, that a delirium would arise from two opposite errors; one from large and repeated bleedings; and the other from wine and the cordial medicines being taken too early. It appears therefore how nice the principles are that regard the cure: thus, neither a hot nor a cool regimen will answer with every patient, nor in every state of the disease."—"Yet were putrefaction the only change made in the body by contagion, it might be easy to cure such fevers by the use of acids only, or other antiseptics. But as the disease, when once formed, is not to be removed by such means alone, it would therefore

fore seem as if some parts of the brain, or nervous system, were early inflamed, and the fever kept up by that inflammation; as if to this circumstance most of the symptoms were owing; and, as if in the advanced state, a cure could not be obtained until the obstructing matter was resolved by suppuration or putrefaction.”* Nothing can more remarkably betray the uncertainty of this eminent physician with respect to the true nature of Pestilential Fevers; nor can any thing more directly point out the desideratum in their cure. The Author has not the presumption to imagine that the happy medium, so much wanted, has been discovered by him; but he has reason to believe, that the candid and unprejudiced practitioner may find in the following little Essay, some observations which may throw light on this very obscure subject. It may at least excite the observing and ingenious to attend more to the peculiar nature of pestilential inflammation; to the exhalation of serous fluid in the cavities of the brain, and the consequent compression of that organ; and to the means which resolve the former without inducing a dangerous state of debility, and promote

* Sir John Pringle's Observations on the Diseases of the Army, 7th ed. p. 316 and 337.

the absorption of the latter, in fevers of a malignant pestilential nature. No doubt the means here recommended will appear bold, and perhaps empirical to an European physician; but let prejudice be set aside, and let facts only be attended to, and sure he is, a candid practitioner will find sufficient encouragement to adopt them. What has been advanced, powerfully militates against theory; but how seldom are the dogmata of theorists found free of fallacy in practice!

Upon the whole: all the Author aims at, is to relate in a plain and unadorned style, the result of his own experience in one of the most dangerous and insidious diseases the human frame is subject to, with the sole view of contributing his mite to the public good: if he succeeds, he will receive the highest possible gratification. With the celebrated Dr. Lind, he may say, "these observations claim the more attention, as not being *only* a few remarks made in private, or on any *one* particular fever, which might prove an exception to a general established principle in practice: They are the result of an attention to some *hundred* patients, whose cases are still preserved."*

* Dissertation on Fevers and Infection, ch. ii. sect. 1.

In excuse for the many inaccuracies of style, and for whatever other errors he may have committed in the Introduction, and in the Essay itself; all he has to plead is, his having wrote both on the spot, where he could not avail himself of much assistance, either from men or books.

Grenada,

June 1, 1794.

PREFACE

TO THE NEW EDITION.

IN the foregoing Preface I have exhibited the motives which induced me to present the Public with a statement of my opinion respecting the nature, and of my reasons for adopting a new mode of treatment of the Malignant Pestilential Fever. Any further address might seem unnecessary, and would, in truth, become so, had not much, and in some instances illiberal, controversy taken place, tending to subvert that opinion, and to discredit that treatment. How far the authority, on which rests the vehement opposition of these controvertists, may be relied on, is certainly an object of importance: but as no facts support them—as no local knowledge or information appear to have been acquired—and as their assertions seem to be founded on the baseless fabric of theory, and the generally received but false idea of the incompatibility of a heated and rarified atmosphere to retain infection—it must necessarily remain with me as visionary, or, at best, equivocal. And I am the more inclined

clined to consider this opposition in a light which reflects little credit or respect on the authors of it, because the result of my own observation, and of the enquiries which I have industriously made, during my later residence in the West Indies, has only served to confirm me more strongly in the truth of what I have already offered on the subject. But, as the Public possess a right to more than simple assertion on my part, I have judged it proper to intrude myself once more on their attention, and to offer my sentiments in a form more diffused, and more capable of fixing the mind, than that of the first Edition of my Essay on the Malignant Pestilential Fever.

In the execution of this design, I have thrown the following work into four parts: the first contains an account of the origin, progress, diagnostic, cause, and other circumstances of the pathology of the disease; each of which is treated of in a distinct chapter: the second relates the means of cure, in five chapters: the three first are appropriated to the discussion of the three general indications of cure, the result of the consideration of the circumstances peculiar to the disease: the fourth is employed in the discussion of the principles on which the efficacy of mercury in the fevers of hot climates in general, and more especially in the Malignant Pestilential and Yellow

low Remittent Fevers, is founded : and the fifth is confined to such observations on the action of oxygenated medicines on the system, deranged by fever and other morbid affections, in hot climates, as have occurred in a very extensive use of them. For this which, on a general view, seems to have little connexion with the subject of the Essay, little apology perhaps is necessary ; and the late discoveries relative to the share which the gaseous fluids have in almost all curative intentions, may preclude the necessity for any. The third part is altogether allotted to the important investigation of the means of prevention. In the course of this enquiry a question of infinite consequence is started, and an attempt made to display the means by which the purpose of it may be fulfilled ; I mean how far the European constitution may be prepared for the process of assimilation to the tropic climates ?

Having thus considered the great outlines of those divisions of the following work which relate to the pathology, the cure, and the prevention of the Malignant Pestilential Fever, I shall proceed to account for the publication of the fourth part.

The opposition which I have had, and have to contend with, in my endeavour to impress the truth of my sentiments on the public mind, relative

tive to the origin and cause of the propagation of the pestilential infection, which has characterised the late direful epidemic; and to the mode of treatment which I, as well as every unprejudiced practitioner in the West India Islands, have found the only successful one, has proceeded from the agents of the Bulama Association in the first instance, and from the medical staff of the armies acting in the West Indies subsequent to the year 1795. The attempts at refutation of the strong facts which have occurred at Grenada, by the agents of the Bulama Association, are similar to the assertions made by the writers for the Levant Company, against the importation of infection into Great Britain immediately from Turkey. The first have imagined that their colonies on the coast of Africa might be injured; and the latter had fears of their trade suffering: we see therefore in both, interest overleaping every obstacle, and shutting the door against truth.* The conduct of the
Gentlemen

* See Ruffel on the Plague, p. 326. See also Medical Repository, vol. i. p. 493, as quoted from a report from the trustees of the Bulama Association to a meeting of the subscribers. In this report every particular relative to the conduct of the inhabitants of Grenada is most falsely stated: not the preventing the abolition of the slave trade; not the obstructing the progress of the *free* colony at Bulama, which could not have been an object of malicious jealousy to them, were the motives to any uncommon zeal they might have displayed on this occasion—they had the malignant
effluvia,

Gentlemen composing the medical staff cannot be so obviously accounted for: was it necessary to exhibit causes for the wide devastation which took place in the military hospitals, we might expect a delineation of facts tending to prove that this proceeded from the faithful observation of the method recommended by me; but what shall

effluvia, proceeding from the contaminated bedding and apparel of an unfortunate number of victims to a fatal malady, demonstrated to them; they daily saw the ravages consequential upon the diffusion of these; they were influenced by the principle of self-preservation in the first instance, and afterwards by that of humanity, to exertion in the destruction of the cause of so widely extended a calamity, and an essential step to this was to transmit the necessary information to, and to urge the adoption of proper preventive measures in Great Britain. Let not the reporter therefore attribute to malice, illiberality, and jealousy, a conduct which the first and best principles actuated; and let him recollect that the *impending pestilence* was not a phantom presented to a timid imagination by the machination of an insidious falsifier, but was probably averted by the cold temperament of a northern wintry atmosphere. The reporter states, "that Capt. Coxe had almost died with grief, from the report cruelly circulated respecting his ship." Happy had it been had this man become a victim to death in any form before the fatal period, when, by his most criminal neglect, or by the operation of the most sordid motive, the semina of pestilential infection being permitted to exist and concentrate on board his ship, were imported into a country hitherto exempt from the scourge of pestilence. Many thousands since borne down by grief, would have rejoiced in the enjoyment of sons, brothers, or fathers, returned in safety from war. What pity can be entertained for a man who has been the cause of mourning to more than six hundred thousand of his fellow-creatures, and of death to fully a hundred thousand!

we say, when we are told that the efficacy, and even danger, of this method, were inculcated at the commencement of the operations of the armies, and before cases occurred on which trials might be made. It is not my intention to enter on the invidious task of displaying the real causes of the loss of 13,437 soldiers, our countrymen, in a period little exceeding thirty months, by the Malignant Pestilential and Yellow Remittent Fevers; but I may, without incurring censure, ask, why the mercurial treatment was not resorted to, when that adopted had so generally failed? No satisfaction will arise from being told, that much of the dreadful mortality which took place proceeded from the latter of these diseases; for the applicability of the question to the nature of the event is not diminished. I should not, however, consider it as necessary to state the general circumstances of the medical conduct of the hospitals, did not the accumulations of death from 1796 to 1798, present an argument to the uninformed, against the utility and propriety of the mercurial treatment of the fatal maladies in question. To such the evidences which the fourth part comprises may be useful; for my own justification I consider them as necessary. A vain and absurd attempt was indeed made in the year 1797, to shew that the exhibition of mer-

cury, in the fatal epidemics which prevailed during that, and the preceding year, had been generally resorted to; and that the general result was far from favourable: but the reports on which this belief was founded, were of such a nature as discredited the position which they were intended to establish; for it is universally known, that the mercurial treatment was industriously condemned by those placed in the direction of the hospitals, and a youthful, inexperienced, and docile staff readily trusted, where attention, application, and a denial of accustomed indulgence, would have been the price of success. Were there a possibility of inaccuracy in this statement, I would rejoice in suppressing it. I am perfectly open to conviction, and feel no enmity to any individual of the staff; but justice to myself, and humanity, shuddering at the destruction of nearly the whole of the West India army, call upon me to declare that there is undoubted authority for stating, that notwithstanding the total inefficacy of the remedies generally employed in the general hospitals, the practice described by me was not resorted to by more than three army physicians in a fair and judicious manner. Two of these gentlemen are unhappily no more; but Dr. Wright is a living monument of the advantages which result from the employment of mercury, conducted

conducted by candor, by professional skill, and by judgment. This gentleman's report has been made public, and the world unite in the eulogium of the author.

The absurd conduct of the medical board at home, at the time Sir Ralph Abercromby's army was formed, is chiefly reprehensible; and may indeed, very justly, be considered as an extenuation of the inexperience, the folly, or the crime, of the younger members of the medical staff of that army. In the name of common sense, let me ask, what useful purposes could arise from a regulation which precluded all from exercising the important functions of an army physician, but such as derived their medical knowledge from seminaries where none can be obtained; or such as were, or became licentiates of the London College of physicians? What had an Oxford or a Cambridge degree; what had a licence to practise within seven miles of London, to do with medical practice within the tropics? Can the whole of that learned body united, communicate that experience in the treatment of inter-tropical fevers, which can be acquired only by a long and painful attention to them in the torrid regions where they are endemic? This singular infatuation, by which the order of things was inverted, proceeded from views best known to the trium-

virate themselves; but its effects may be considered as the remote cause of all the misfortunes which befel the devoted troops composing the army under the command of Sir Ralph Abercromby. Our country, therefore, have inexpugnable reasons for consigning a board, whose resolves and regulations militate so forcibly against the sober dictates of common sense, and whose self-sufficiency has given existence to a cloud which obscures the most manifest proofs of the baleful tendency of their measures; to the fate of the unhappy victims who have fallen under the operation of both.*

The fourth part of the following work is intended to constitute, therefore, a body of evidence, to shew the fallacy of the statements and reasoning of the agents of the Bulama Association; and to exhibit the disingenuous conduct of the medical staff, and the fatal consequences of a disbelief of the efficacy of a remedy which had been established by the experience of a multitude

* A noble Admiral, who, whilst he has greatly contributed to the safety of his country, has crowned himself with an unfading wreath, thus gave his opinion of the measures of the Medical Board, in the year 1795. "I am ignorant how your hospital staff is arranged, but I have generally understood, that the first appointments were to be given to persons here (England), and not to those on the spot; a system which may be justified by precedent, though in opposition to common sense."

of eminent practitioners in all the West India Islands, where the calamity it was calculated to correct, existed. In treating this part of my subject, the views of the actual state of each colony, I have given, may be considered as too diffuse, and unnecessarily minute; but I have found the matter which presented itself, important; and the shades of variation are too considerable to remain unexamined in the investigation of morbid causes. Those objects which are common to all, have been sufficiently explored in the Introduction to the first Edition, which I have therefore given a place in this.

The Appendix contains a variety of cases illustrative of the doctrine I have advanced in the second part. Those of the Yellow Remittent Fever will probably have their use in throwing more light on the peculiar nature and treatment of the Malignant Pestilential Fever, which it has often been mistaken for; and such as relate to the operation of oxygen, disengaged in the system from the nitrous acid, and oxygenated muriate of potash, exhibited alone, or in combination with mercurial oxyds, will at least gratify curiosity.

Those of my Readers who have acquaintance with a very useful medical work, periodically published at New York under the denomination of the Medical Repository, may judge it necessary

that I should vindicate myself from the aspersions so liberally thrown out by a late ingenious conductor of that work, which were founded on the inconsistent information, and at the malevolent instigation, of a member of the council of Buzama.* I shall not here enter into any vindication of myself; the merits of my cause will appear in the recital of facts in the 1st section of the 1st part. Dr. Smith has since then paid the debt of nature. He could not, therefore, himself acknowledge the illiberality of his paper; but the gentlemen, who, with equal credit and honour to themselves, continue the superintendence of the Medical Repository, have not failed to do justice to my principles, to perceive and acquiesce in the disinterestedness of my motives, and to admit the truth of my statements. Dr. Mitchell and Dr. Miller of New York thus express themselves. “ Dr. Chisholm indignantly repels the censure passed on his conduct; and in doing this, he manifests the warmth of conscious integrity, and the irritation of offended honour. As it was never our wish to criminate the motives of that gentleman, we observe, with pleasure, the explanations offered in his defence. And we think ourselves authorised thus publicly and explicitly to apply the language of retraction, which

* Medical Repository, vol. i. p. 471.

our deceased friend had pledged himself to employ," when he declared, " I shall be as ready to withdraw the censures that I have passed upon him, should he convince me that they are unmerited, as I have been free to advance them; and in a manner equally public."* With this apology for the unmerited conduct, and the unqualified credulity of the late Dr. E. H. Smith, all irritation on my part ceases: but the singular inconsistency of Mr. Paiba, on whose authority I advanced the circumstances of the narrative of the fate of the Bulama settlement, becomes more conspicuous. Many of these circumstances are supported by the testimony of gentlemen of respectability now living in Grenada, and the other islands at which the Hankey touched, or connected with them, although resident in England: and they have been illustrated by the concurring relation of facts of several who have been embarked in the same scheme of colonization, or who have visited those parts of the coast of Africa in the pursuit of commercial views.

Dr. Trotter of the navy has thrown out remarks, the tendency of which is, to invalidate the authority on which I found my opinion relative to the origin, the nature, and the treatment of the Malignant Pestilential Fever. It would

* Medical Repository, vol. ii. p. 285.

be with no uncommon concern I should enter the lists of controversy with a gentleman whose liberality of thinking, professional skill, and exertions in the cause of suffering humanity, have placed high in the estimation of the public; and I trust that a more attentive consideration of the facts and reasoning I have submitted to the public in the following work, will remove that inclination to differ from me, which is only too apparent in several passages of his excellent work, the *Medicina Nautica*. Dr. Trotter will permit me to offer to his serious consideration, how far a physician is warranted in sporting with, or lightly judging of the authority and credit of a writer, when he is ignorant of local circumstances, and is dispossessed of an adequate knowledge of points, the establishment of which might either render doubtful, or altogether invalidate the propositions of the latter. Great weight has been very properly attached by Dr. Trotter to the evidence of Commodore Dodd and Mr. Smithers, surgeon of the *Charon*: and, on further enquiry, I find I have been incorrect in my statement of the circumstances of the interview which the *Charon* had with the *Hankey* at St. Jago. In the year 1797 I was politely favoured by Mr. Lloyd, then first lieutenant of the *Beaver* sloop of war, Captain Brown, with the perusal of
a log-

a log-book kept by his brother, a lieutenant of the *Charon*, during the voyage in question: in this I found that no sickness took place on board that ship in consequence of the interview. A log-book is unquestionably evidence, and therefore I have suppressed what I advanced on this affair on the authority of the late Mr. Home: but why Mr. Home should mention this as a fact communicated to him by Commodore Dodd, I can assign no reason. However unfounded this assertion has been proved, it by no means follows, "that the account given by Commodore Dodd, and his surgeon, tends very much to shake the opinion of the disease being imported:" for a series of incontrovertible facts prevents me from hesitating in asserting that *imported infection* was the sole cause of the Malignant Pestilential Fever of Grenada; the evidence is too strong to admit the formation of a doubt; and universal conviction is carried to the minds of those who resided on the island, experienced the baneful consequences of incredulity and scepticism, and had demonstrative proofs of the manner of introduction of the fatal malady. That the fever was not confined to Grenada, but spread from thence to the other islands, and to the continent of America, I think will be firmly established by the communications contained in the fourth part; and

and I therefore trust Dr. Trotter will find cause to withdraw his observation, that “this assertion is given on too slight grounds.”

As a sufficient cause for holding a different opinion from Dr. Rush of Philadelphia, on the origin of the fever which devastated that city in the years 1793 and 1794, I might propose, in addition to what I have said in the body of the following work, the fatal and reiterated experience of the inhabitants of Philadelphia, New York, and other cities of the United States, almost every year since, notwithstanding the wise regulations which have been instituted, and the excellent police which has been established, and rigorously carried into effect. The most retired recesses of endemic causes of disease have been explored, and exposed to the correcting influence of a pure atmosphere, or the efficacy of counteracting powers; every refuge of septic exhalation has been destroyed, and the resources of chemistry have been exhausted; yet still pestilential infection has annually reared its dreadful head, and spread indiscriminate destruction wherever it appeared.

I take this opportunity to acknowledge the obligations I have been laid under by several eminent practitioners in the West India Islands, who, I trust, will be recompensed by the general conviction which will follow the perusal of their communications.

communications. It is no more than justice to these gentlemen to observe here, that the communications they have favoured me with, are extremely important: they are not, indeed, the report of men high in office; but they are the result of faithful observation, unbiaſed by prejudice, untinged by the dark colouring of influence, and the meanness of conſequent ſubmiſſion: they have proceeded from men anxious for the promotion of their profeſſion, and for the extension of the intereſts of humanity: from men who have long ſince felt that the firſt ſocial principle is ſenſibility to the miſeries of others, and that inhumanity reduces us to a level with the ferocious nature—from men capable of joining in the expreſſion of theſe tender lines—

“ Ne cache point tes pleurs, ceſſe de t’en défendre :
C’eſt de l’humanité la marque la plus tendre.
Malheur aux cœurs ingrats, et nés pour les forfaits,
Que les douleurs d’autrui n’ont attendris jamais ! ”

Before I conclude, I ſhall take leave to obſerve, that as I have not wrote for polemic purpoſes; as it is not my intention to harbour an opinion that is not the reſult of conviction; as my ſole view is to contribute to the benefit and happineſs of mankind, by the diffuſion of uſeful knowledge; ſo it will not be expected that the unfounded

founded remarks of a cavilling party writer ; the inane objections of those ignorant of local circumstances ; the sterile declamation of pseudo-philanthropists ; the perversion of truth to the elevation of fancied pre-eminence ; or the maintenance of palpable falsehood ; can have any weight with, or shall obtain any attention from me. I trust it will also be impressed, that as I mean nothing personal, in any apparently harsh observations which circumstances may give rise to, so do I entertain no enmity whatsoever. But should, however, any one feel displeased at the freedom I thus take, let me pray them to remember the excellent saying of Voltaire, I believe, and conduct themselves accordingly : “ *Que le seul moyen d'obliger les hommes à dire du bien de nous, c'est d'en faire.* ”

INTRODUCTION.

BEFORE I enter on the History of the Malignant Pestilential Fever, which so generally prevailed in this and the neighbouring islands, I think it may not be improper to give some account of Grenada, as far as relates to the face of the country, its productions, its diseases, and the state of the weather. On settling in this island, I was convinced that a knowledge of the climate, and of the various changes which take place in the weather throughout the year, would be highly conducive to success in the practice of Medicine; and I was the more strongly inclined to observe and record these, by finding that nothing of the kind had been hitherto done. For this purpose I immediately began a diary or journal of the weather; and have ever since continued it, with few interruptions; but, as a journal of the whole period would be tedious and unnecessary, I have given only that of the three first years; and to illustrate my Observations on
the

the Malignant Pestilential Fever, I have added the journal of the weather for the year 1793. Dr. Hillary is the only medical writer I am acquainted with, who has given the public any account of the weather of these islands; but, although his very able account may be very useful to practitioners in Barbadoes, and other islands whose surface is comparatively level, and whose hills rise only to a trifling height, and in no instance exhibit the wild and picturesque scenes of Grenada, St. Vincent, Dominica, and a few others, it is not so here: and the reason is evident. The windings of the innumerable hills in Grenada produce a change of temperature at the end of every hundred yards; under their shelter the heat is often almost unsupportable, and the body is bathed in the most profuse sweat: beyond this, turning an angle, and being suddenly exposed to the prevailing winds, which there blow with violence, proportioned, to the narrow vallies which confine them, the body is in an instant dried up: an aguish sensation takes place, and not unfrequently topical pains and inflammations of a most dangerous nature, are instantaneously produced. It is from this cause, as much as from any other, that hepatic and pulmonary inflammations are more frequent, and more violent in these rugged mountainous islands than in Barbadoes, Antigua, and

and others of a smoother and less divided surface: and this is the principal cause also that topical inflammations, particularly those of the liver, are met with at all seasons, during the hot and rainy as well as the cool and dry: a circumstance otherwise inexplicable. It also accounts for the efficacy, as a preventative of any medium between the shirt and skin, which may absorb the perspired fluid, whilst it keeps up an equal temperature on the surface, whatever changes take place in the surrounding atmosphere. Thus, a flannel-shirt, however strange it may seem to an European not acquainted with the circumstance above mentioned, is the best preservative of health in this island, and perhaps throughout the torrid zone.

The atmosphere of Grenada differs widely from that of the low islands, Barbadoes, Antigua, &c. The innumerable points and ridges of the two mountains, which run nearly north and south, and separate the windward from the leeward districts, arrest or attract the passing clouds. These, either falling in rain, or giving rise to springs, whilst they fertilize the soil, fill the atmosphere with watery particles. This moist state of the atmosphere exists throughout the whole year; but is greater in proportion to the quantity and density of the clouds. In the
rainy

rainy season torrents of water rush down the craggy sides of the higher regions of these mountains; and the rivulets, often overflowing their banks by this addition, inundate the country below. In the dry season, a considerable degree of moisture is always perceptible; but then it falls during the night in the form of dew; and the streams and rivulets, though plentifully supplied, run in their natural channels with a placid current, except where their course is interrupted by precipitous rocks or large stones. The atmosphere of the low islands, on the contrary, is generally remarkably dry; nor are they blessed with the streams and rivers which beautify and benefit Grenada. Hence the temperature in situations even not subject to alternate cold and heat, is very irregular; and from this also it is seldom possible to work an electrical machine with advantage, the fluid collected continually flying off, attracted by the surrounding moisture. From this cause too the island, seen from sea, is for ever obscured with clouds; the summits of the mountains are almost never distinguishable; and even hills nearer the coast, on account of the density of the medium through which they are viewed, seldom exhibit their true shape, height, and colour. The low islands are never thus enveloped in mist, never thus seem “ever-
threat’ning

threat'ning storms ;" their atmosphere being less loaded, becomes a purer medium, and seldom lets fall the deluges experienced here. From these considerations, the following Journal may have its use.

Grenada is one of the most southern of the Caribbean islands : a situation which exempts it from the dreadful hurricanes which frequently lay waste those farther northward. It is composed of two immense mountains, which terminate in peaks ; but, being united a little below their summits by a gradual slope, the division is not at first very perceptible. On the windward, or north-east side, the descent is infinitely more gradual than on the leeward or south-west side ; nor is it there encumbered with the multitude of conical hills, and rocks of various form and magnitude, which characterise the latter. So gradual is the rise of the country in the district of Marquis and part of Seauteur, as to give the idea of an extensive plain, most beautifully diversified by gentle slopes, rivers, delightful vales, thickets and extensive cane-fields, and terminated by wooded mountains, whose pointed tops are often hid in clouds. The leeward side, on the contrary, is mountainous to the very sea ; and the whole is thrown together in the wildest and most picturesque manner. Magnitude and boldness of design are the

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prevailing features. In general, excepting a part of the windward side of the island, by supposing innumerable and distinct acclivities of conical or angular figures, increasing in bulk as they are removed from the sea, crowding on each other, and at length terminating in two enormous piles, whose crags and ridges shagged with wood, and whose cliffs are often seen towering above the floating clouds in august and gigantic forms, exhibit a most stupendous back-ground,—we shall be able to conceive a tolerably just idea of the grand outlines of the very singular scenery of this romantic country. On more attentively viewing the picture, we find hills precipitous, acclivous, or winding circularly in sharp inaccessible ridges, so as to form frightful gullies, torn by torrents in the rainy season, or deep, dark glens and bounded hollows, seldom trod by human foot; where streams, brawling over pebbly beds, or often interrupted in their course, and falling over the surface of a rocky scarp, and collected in stony basins underneath, form shady cool retreats; in which alone

“ —————Planxère forores

Naiades —————

Planxère et Dryades, Plangentibus affonat Echo.”

OVID.

All around is a “woody theatre, of stateliest view,” and shrubby and flowing herbs of uncommon variety, beauty, and flavour. In many places the scene is enlivened by cascades, sometimes fifty feet in height; but no living creature, except the wood-pigeon, a few small birds, the dappled agootee, and the armadilloe, inhabit these wilds. Where cultivation ends, little scattered spots are seen diversifying this wilderness of wood, on which the industrious hands of poor settlers, chiefly French, have formed small plantations of coffee, intermixed with plantains, and sheltered from the rude shock of the prevailing north-east wind, by hedges of the ever green calaba*, whose deep shade affords an interesting variegation from the surrounding paler green. Alternating with these are seen neat but small patches, producing all the kitchen can require in the vegetable kingdom; which, continual moisture and coolness contributing to their production, are ever plentifully raised. Beyond this, cultivation takes a larger sweep, and often with coffee, cacao, cotton, are seen fields of sugarcane, planted and flourishing on the steep sides of hills, or in narrow winding vallies, frequently chequered by insulated cones, or tufted crags of

* *Calophyllum Calaba*, Linnæi.

grotesque figures; or overhanging cliffs matted o'er with curious grassy plants,* ferns, or moss; or bare argillaceous rocks, disposed in inclining or horizontal strata; or volcanic masses, distinct, loose, and black; or extended terraces of soil, in culture or in wood, supported by majestic columns of the basaltic kind. Here too are seen the stately mountain-cabbage, and the wide-spreading silk cotton-trees, towering above all others, in majestic pre-eminence: rivers are seen winding through every valley, and here and there natural pastures are left, on which the cattle and stock of neighbouring plantations are seen feeding. Farther on, and even to the sea, where the surface admits of cultivation, the whole is covered with the sugar-cane, regularly planted in oblong fields, separated by hedges of the lime, the logwood, the Angola-pea, the false acacia, the prickly pear, physic-nut, &c. These are frequently diversified by irregular groupes of negro-

* *Pitcarnia latefolia* et *angustifolia*, a new genus of the Hexandria Monogynia Linnæi. It covers the steepest rocks in a very singular manner, resembling at a distance some species of grass; the leaves lap over each other, and form a thick mat, by which precipices, on which no other plant grows, are completely covered. From amidst these, beautiful ramous clusters of coral-coloured flowers project.

My authority for the name, is my worthy friend Mr. Anderson, Botanist at St. Vincent.

huts,

huts, furrounded by and intermixed with groves of the banana, and arbours of the grenadilla, water-lemon, and various viminious plants of the pea kind. Adjoining these romantic groupes, are seen the dwelling-houses, and the works, as they are called, or the buildings erected for the manufacture of the cane-juice into sugar; to which not unfrequently are attached orchards containing a great variety of indigenous and exotic fruit-trees. In detached corners also are seen the gardens or provision-grounds of the negroes, planted according to the whim or taste of the temporary owner; and here and there the tops of conical hills, too steep or too barren for culture, crowned with tufts of natural wood, become interesting objects, from the variety of tints they introduce.

The coast in many places terminates abruptly in rocky precipices, the face of which is often curiously perforated into caverns, arches, &c. by the continual dashing of the sea against it. The tops of these precipices are sometimes fertile, but more generally either a bare soft rock, probably a volcanic production, called by the inhabitants, Tuf, or producing a curious species of cyperus, intermixed with trees of the erect prickly pear, or the Abyssinian koll-quall of Mr. Bruce. In other places, it runs out into long narrow points,

frequently ending in high cliffs of tuf, but more frequently in curious rocks or congeries of the Madripore coralline, the cells of which nearest the sea, and occasionally overflowed by it, are inhabited by zoophytes, lithophytes, and animals of the Mollusca-tribe. These points are seldom covered with much soil, but generally serve well for sheep and goat pastures. They form small but convenient and deep bays, particularly on the south-east coast. Some of these bays insinuate themselves so far into the country, as, when seen in certain points of view, to have all the ornamental effect of winding lakes : and at Calivini, Bacaye, and a few other places, they have the additional beauty of fine sloping woods, intermixed with lawns of the brightest green, and a back ground of picturesque scenes in the interior country. Sometimes, however, the coast trends circularly for several miles ; low, sandy, without a single inlet, and protected from the encroachments of the ocean, which beats against it with all the additional force of the easterly or trade-wind, by a prodigious barrier of corallines. Rivers being here frequently shut up by mounds of loose sand thrown up in their mouths by the violence of the surf, much stagnant water and marshy tracts are found, at all times corrupting the air to leeward of them for several miles ;

miles ; these districts therefore, although incomparably the richest, and in many respects the most beautiful, are the most inimical to health of any of the island.

All along the coast, a prodigious variety of corallines, of every form, stretch from the north-east round easterly to the south-west: the bottom almost everywhere in that direction is formed of them, at least a league in breadth ; and in some places, particularly off the south-east, extensive submarine groves, of a most beautiful muricated madripore, are seen, chiefly of a bright pink-colour. These coralline-beds and groves are frequently extremely dangerous to shipping. They are often fished up for the purpose of making lime, which they answer tolerably well in temporary buildings ; but the lime manufactured from them, possesses by no means the strength of the stone-lime. The transparency of the water over these coral-lines is so remarkably great, that the bottom can be distinctly seen at the depth of ten and fifteen fathoms ; and on taking a view of the coast from any considerable adjoining height, the whitish or light green colour of the sea, clearly points out the limits of these curious productions. Everywhere on their surface vast quantities of echini and asterias are found ; the former troublesome and even dangerous, by their

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long and strong prickles, or spines. They constitute also the secure abode, except in stormy weather, of innumerable crabs, sea cray-fish and univalve shell-fish : of the last of which there is a great and beautiful variety. Many species of the sponge, particularly the flabelliform, the festularis, the aculeata, and the nodosa, also, lodge on these lithophyte-beds. Vast numbers of excellent small fish are always found within the limits of the corallines, particularly where marine vegetables abound ; but the larger kinds resort to the sand-banks a few leagues to leeward of the island, or are caught in deep water, where no corallines are found.

From the south-west to the north-east, along the western shore, no corallines are ever seen, the coast being amazingly bold and precipitous ; and the shore where the bottom is shelving being covered with stones of the quartzose and shorl kinds, quadrangular, prismatic, or oval, and of a bluish grey colour ; either thrown up by the sea, or the produce of its encroachment on the adjoining high rocky cliffs. These, on this part of the coast, are often overhanging in an awful and tremendous manner, and (the road running underneath) have been not unfrequently fatal to passengers, particularly after very stormy weather ; during which, the sea beating with dreadful violence

lence against their lower strata, has shaken the whole mass, and loosened and disjoined large fragments. Together with these are frequently found some beautiful species of the marcasite, chiefly of a yellow and dark blue.*

Along the edges of bays, seldom ruffled by boisterous winds, or the pieces of sea-water, called Lagoons, whose situation screens them from the undulation of bays, the action of the tides, or the agitation of winds, a curious species of actinia, adhering to stones and corallines, is found; and that singular insect of the mollusca kind, called by Linnæus, *Holothuria Priapus*.

This species of holothuria, which, till of late, was almost unknown, inhabits a membranaceous semi transparent sheath, perhaps of its own construction, always contained in a tubular hole in rocks, two or three feet under the surface of the water. From this it pushes out and expands its

* On two parts of this coast, the most regular basaltic I ever saw, form two points, exactly resembling at a distance the huge fluted columns of Gothic Churches. Some of these are perpendicular, some are inclining; and where the points terminate, masses composed of the broken ends of basaltic columns, run shelving a considerable way into the sea. These are most perfect between Black Bay and Grand Roy, where the inhabitants call them the "organs;" and though not so extensive as the singular basaltic of Staffa, as represented by the celebrated Sir Joseph Banks, are evidently similar in every respect.

tentacula in quest of food; but draws all in on the slightest appearance of danger; so that it is extremely difficult to procure one uninjured. The tentacula of this species, when spread out by the animal, form a seeming flower, exactly resembling the larger *passiflora*, or *granadilla*. The length of the body, which has much the appearance of that of the larger *scolopendra*, is about five or six inches, and marked with innumerable annular ridges, which near the mouth, or tentacula, are more distinct and prominent.—These annuli terminate on each side in very minute claws or feet, which serve the animal in creeping out of its sheath, to a limited length, in quest of food. The tentacula are of a most singular structure, and variegated with a number of beautiful colours, the most conspicuous of which are purple and yellow. Each tentaculum is about two or three inches in length, and plumose, or formed in the manner of the *plumæ* or *laminæ* of feathers, the beards of which are endowed with exquisite feeling, for on the slightest undulation of the water, or striking gently the vessel containing it, they are instantly erected, and exhibit a singular and most beautiful assemblage of colours. If the undulation of the water is increased, or if any of the tentacula are slightly touched, the

the animal instantly, and with astonishing quickness, withdraws into its sheath or habitation, and nothing is apparently seen but a piece of ill-looking membranaceous sea-weed.

The soil of Grenada may be divided into four kinds: 1st. A black rich mould, found chiefly in low vallies, and on the gentle slopes of the more rounded hills. 2d. A mixture of light sand and black mould, generally found near the sea, and containing a large portion of sea-salt. 3d. A mixture of black mould, sand, and a metallic earth, of a reddish colour, found in the steeper parts of what may be called the second region of the island, or where cultivation is extended with difficulty. 4th, A red earth, or ochre, frequently intermixed with black shining metallic particles, sterile, and incapable of culture with even the aid of the strongest manure. This is generally found in the higher parts of the mountainous country, sometimes covered with wood and a coarse long grass; but oftener naked, and producing a fine effect contrasted with the surrounding green. The depth of these varies very much: in some places it is only a few inches; in others, particularly in deep vallies, several feet, and evidently there, the accumulation of the washings from the adjoining hills in the rainy season: in other places, particularly where the soft rocky substance,

substance, called Tuf, prevails (probably the tuffa* of the Italians) the depth of the soil is not more than half an inch; and to be found only in chinks and fissures. In many places, where the eye can trace no vestige of soil, shrubs and large trees grow, insinuating their roots into every cranny of the rock in search of food; or creeping on, or hanging down naked and unconnected, the sides of rocky precipices, and at length drawing their nourishment from soil forty or fifty feet below the trunk or stem of the plant. Generally, under this coat of soil there is a rocky substance, soft where it is connected to the soil, and hardening as it deepens. It is followed, in many places, by curious strata of argillaceous rock, which are separated from each other by strata or layers of black mould, frequently mixed with shells of the cochlea kind, and some marine productions of the testaceous tribe, particularly various turbines and bivalves. Alternate strata thus formed are often found in excavated places many hundred

* In Sir William Hamilton's account of the earthquakes which happened in Calabria, from February to May 1783, letter of the 23d of May, mention is made of this volcanic substance, "I pushed on to the town of Pezzo, in Calabria Ultra, where I landed on the evening of the 6th of May. This town, situated on the sea, and on a volcanic tuffa, had been greatly damaged." &c. — *New Annual Register*, 1783. See also *Ferber's Letters on Italy*, *Fourci and Chaptal's Elements of Chemistry*.

feet under the surface. They generally observe the inclination or angle which the hill or valley in which they are found, makes with the horizon : thus, some are oblique, others horizontal ; and in proportion to the depth, the hardness of the argillaceous strata increases. In other places, under the soil is a thick bed of stone, the production probably of volcanic fire, of a deep brown or chocolate colour, and breaking into oblong, smooth, homogeneous quadrilateral masses, very regularly formed. These, as they deepen, become more soft and crumbly ; but always retain their form, till at length they are so united with a yellowish earth, as scarcely to be distinguishable from it. In places excavated perpendicularly, and long exposed to the weather, these imperfect crystallizations, if they may be called such, are seen separated from the earthy matter connecting them, and hanging in the manner of icicles, and displaying their form with the utmost exactness. In the yellowish earth underneath these quadrilateral masses, several stones of a bright shining blue are found single, and of a depressed oval shape. Many hills, particularly those which are of a conical form, have, under the soil, strata of a substance much resembling calx at first sight ; but on examination, found to be calcined stones and ashes, compressed into laminæ. These laminæ

minæ are separated from each other by a greyish earth, mixed with innumerable small pebbles, much used in making mortar.

The district of St. George's parish, called Point Saline, forming an isosceles triangle, the base of which may be four miles in length, is almost entirely composed of the soft rocky substance, called Tuf; and fully a third of it is destitute of soil, except here and there in little hollows and fissures; or where the surface of the tuf, softened by the action of the air, has become a kind of vegetative earth. The whole of this immense mass is made up of regular layers, or laminæ, inclining or horizontal, as the surface is acclivous or flat. Three conical hills, of about five or six hundred feet perpendicular height, situated in the midst of this, particularly those constituting what is called Morne Rouge, or the red mountain, are entirely composed of vitrified rocks and stones, of a black or brown colour, and scorix intermixed with an earth exactly resembling iron rust, reduced to powder. No trace, however, of the crater of a volcano can be perceived on any of them; but they are so placed, with respect to each other, as to form a very deep circumscribed hollow, which once perhaps was the crater of an immense volcano. The scorix, by the action of
air,

air, has been reduced in some patches of these hills, into a very fertile purplish soil, producing in seasonable years abundant crops of cotton.

None of these rocky substances effervesce with acids; so that they evidently possess nothing of the calcarious nature. The first I have mentioned, or the argillaceous strata, vary a good deal in colour; some being of a pure white, some yellowish, and others bluish: they are all smooth and soapy, or unctuous to the touch, free of grit, and dissolve readily in water. They are called by the Creole whites and negroes, Aboo and Caioo; probably corruptions of the two French words *bone*, signifying dirt or clay; and *craie*, chalk: and by African negroes, before they have acquired the language of their brethren in the West Indies, Treing: an Ebo word, signifying a purer kind of pipe-clay, much used with food by most of the inhabitants of the coast of Guinea. All these varieties are eat with astonishing avidity by negroes of almost every description, but particularly the females: a pernicious custom, originally superstitious perhaps, and certainly introduced from Africa. It is the most general cause of the fatal cacochymic complaint among negroes, called here *Mal d'Estomac*.

Having thus given a general account of the appearance of the country, and its soil, I should

now

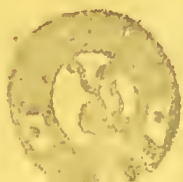
now describe the various productions of Grenada, and more especially the medicinal plants, which abound everywhere; but although the subject is extremely curious, and merits a distinct treatise, I confess myself unequal to the task, Botany having never been my study, though frequently my amusement. To no country is the observation of the celebrated Mr. Ray more applicable than this, "*Tales plantarum species in quacun- que regione a Deo creantur quales hominibus et animalibus ibidem natis maxime conveniunt: imo ex plantarum nascentium frequentia se fere animadvertere posse quibus morbis quælibet regio subjecta fit,*" &c.—Every human want, except those introduced by European luxury, is here amply provided for, almost without exertion.

The most wholesome food is the spontaneous production of the country. The various species of the banana, of the potatoe, of the pea, of the bean, of the cassada, stand unrivalled in salubrity and native elegance of taste. To these may be added a variety of pot-herbs and greens, unknown in Europe; and at least sixty kinds of fruit, chiefly natives of the country, of the most delicious flavour and taste. To strengthen and give tone to the stomach, diminished by debilitating causes continually present, various peppers and grateful stimulating plants spontaneously present themselves.

themselves. Is the traveller in the woods parched with heat, and languishing for diluting drink, the kindly water-withe and wild pine, are on every tree ready to assuage his thirst. Do the chilling northerly winds of winter check the perspiration and excite catarrhal complaints, many hundred plants well suited to remove them, are everywhere furnished by Nature. Do fevers prevail, the same kind Provider has amply bestowed on us the means of relief. Are ever any afflicted with dysenteries, certain means of cure are found in every field, in every wood, and even climbing on the most sterile rocks.* No people are more afflicted with worms than the inhabitants of this country; nor are any more bountifully supplied by the hands of Nature with specifics against them. Ulcers, so obstinate and troublesome in other regions, however malignant, must here yield to the native deterfives and incarnants of the country. The loathsome yaws are cured by simples. The Venereal Virus has its antidotes.†. The leprosy, the most dreadful of all diseases;

* The *bignonia capriolata*, called by the French *Griffe à Chat*, is of this tribe; is always found climbing on bare rocks, and is even a specific in this very dangerous disease.

† Among these may be mentioned *euphorbia tithymaloides*, the *mal-nommé* of the French; that singular plant *saururus cer-*



diseases, is said to have its indigenous remedy, known to few besides the aborigines of the islands.* Although the inhabitants seldom require their aid, yet innumerable antiscorbutics are prepared by nature for the soldier and the mariner, wore down by long voyages and the scurvy. Every poisonous herb or tree have their use; and are prevented from being mischievous, by an adjoining antidote. Nay, the baneful effects of the manchineal may be prevented by the liberal and kind provision made by Nature. Does the imprudence or the ignorance of man lead him to the dangerous experience of the deadly juice of this alluring fruit, the sea is close at hand into which he instinctively plunges for relief, or the white trumpet-flower tree extends its branches, and intermingling them with those of its enemy, interposes antidotal power. Nor is this most poisonous of all plants without its medicinal use; for, by an easy and simple operation, its juice in the state of vapour extirpates those

næus, the herbe à colet of the French; lobelia syphititica; and costus spicatus, a new species pointed out to me by that ingenious and indefatigable botanist, Mr. Anderson of St. Vincent.

* This remedy, I am informed, is the saururus cernuus of Linnæus, the herbe à colet, and aguarima of M. Desportes. The Carribs are said to use it successfully; externally and internally, in this deplorable disease.

troublesome

troublesome and obstinate fungi, the sequela of the yaws, called crabs and tubboes.* In short, whatever can contribute to the ease and comfort of man; to his food, his drink, his medicine, his clothing, his dwelling, his utensils of husbandry, his household utensils, his bedding: to the construction of his boats and canoes, are here abundantly, and in most instances spontaneously produced. “*Ipse quoque immunis rastrisque intacta, nec ullis faucibus vomeribus, per se dabat omnia tellus.*” Nor is his food confined to the vegetable kingdom. Horned cattle, sheep, goats, hogs, rabbits, agootees or Indian conies, and guananas; dunghill-fowls, turkies, geese, ducks, Guinea-fowls, and house-pigeons, are at all times to be procured. At certain seasons, particularly in the autumnal months, there is not a scarcity of

* Sea-water I have repeatedly seen remove the dangerous effects of this poison; and the *bignonia lucoxylon* (the white cedar of the country) is said to be also a certain antidote. The operation I allude to is this: A hole large enough being dug in the sand, alternate layers of charcoal and manchineal apples are laid in it. When the charcoal is well lighted, and a thick smoke arises, the patient is made to place the diseased foot over it; and a piece of thick Osnaburgh is laid over all, to prevent the escape of the vapour. At the end of an hour the foot is removed, and the crabs, which before the application of the steam were hard and untractable, are now completely rotten, insomuch that without giving the least pain, they are picked out with a small pointed knife.

what may be called game, wood-pigeons, or ramiers, ring-tailed pigeons, snipes, teals, water-hens, wild-ducks, plovers, blue and grey galdings, blackbirds, &c. But an inexhaustible supply of fish, of uncommon variety and goodness, may be throughout the whole year resorted to: all the rivers, bays, and sea teem with them; and being easily procured, they constitute almost the only animal food of the lower classes of people. Black, red, and grey snappers, rock-fish, groopers, Spanish mackerel, king-fish, ten-pounder, porgie, barracuta and pargue cavalloe, old-wife, sea-mullet, trunk, hog, bream, gar, ballahoo, jacks and sprats, silver ballahoo, parrot, butter-fish, maid, flounder, foal, a kind of herring, sun-fish, snook, car-ramaws, sting-ray and whip-ray, fennets, jew-fish (rare) yellow tails, conger-eels, turtle of three kinds, and a multitude of shell-fish, are among the best of the sea-fish. River mullet, mud-fish, crapaud or river toad-fish, silver-eel, and innumerable cray-fish, the most esteemed of the fresh water fish.

It is not therefore surprising that foreign luxuries too liberally used, should shorten the lives of one description of inhabitants, whilst another, confining themselves to the wholesome indigenous aliment of the country, with occasionally the addition of the least injurious of the European

pean

pean delicacies, live to an age uncommon even in the temperate regions of the old continent. The old monastic rhyme is in all countries the best rule of diet :

“ Pone gulæ metas, ut sit tibi longior ætas ;

Ut medicus fatur, parcus de morte levatur.”*

But it is more especially so here, where great efforts are made by Nature in the assimilation of the European constitution to the tropic climate in the first instance ; and where diseases, mild among the indigenæ, or the assimilated country, become fatal to the imprudent stranger. In fact, it is this circumstance which has given rise in Europe to the prevailing idea of the unhealthfulness of these islands, and of Grenada in particular ; for the climate of Grenada, notwithstanding the variable temperature, occasioned by the irregularity of its surface, and the moisture of its atmosphere, is certainly healthy, compared to other countries in the same latitude ; and would prove so to every description of its inhabitants, were they all equally temperate, and equally careful to avoid those excesses in diet, which in all climates are dangerous, and often fatal. To prove this, no more is necessary than to attend to the unin-

* L'Ecole de Salerne, p. 87.

interrupted health and great age of many of the French and Creole inhabitants of both sexes. Eighty, ninety, and an hundred years is by no means an uncommon age among these; and females are in general longer lived than males. One instance has occurred, of life being lengthened out to the 127th year;* an age not very far short of the famed instances of longevity of our own country; and, if the climates are considered, certainly more extraordinary. An anecdote lately related to me of this aged person, is uncommonly singular. M. Forthon lived on a coffee-estate in that part of the parish of St. George, called Foret Noire, or the Black Forest, about five miles from town. The gentleman who related the anecdote to me, with another, visited this old gentleman two or three years before his death. They found him employed in having a negro-wench flogged: and as he was blind, he was led to the place where the culprit lay, in order, by feeling, to know whether the punishment had been properly inflicted or not. Being satisfied in

* James Forthon, Esq. in the 127th year of his age, in Grenada. He was born at Bourdeaux in 1645, settled in the West Indies in 1694, married at St. Christopher, and removed to Martinique, where he remained thirty years, and has resided in Grenada forty. He retained his eye-sight till his 117th year, and his health till within a few days of his death.'—*Annual Register*, 1773, *March*.

this point, he returned with a firm steady step to his seat. The cause of this punishment was still more extraordinary. A Mr. Maly, Mr. Forthons's grandson-in-law, assured my informant, that Forthons punished the wench, who acted as a kind of housekeeper to him, for refusing to admit of his embraces. The French and Creole inhabitants are never afflicted with the fatal topical inflammations, often epidemic among the English and negroes; nor do fevers of a bad kind ever appear among them. Their strength continues as unimpaired as their constitutions; so that it is no uncommon thing to see a very old Frenchman walk and ride with all the firmness and activity of youth. This does not appear to arise from their residence being cooler and higher than that of the English inhabitants; for many, possessing fine plantations on the coast, enjoy the same exemption from disease, experienced by the coffee-settlers on the mountains, although the difference of heat is as thirteen to rather more than seventeen.

Were we to exclude the effects of the miasma of the marshy districts, and those proceeding from the irregular temperature of the air, we should find that, in common years, there is by no means much sickness; and that in general it is only in those places where marshes are abun-

dant, as in Marquis, Seauteur, and a few detached spots in other parts of the coast, diseases *mali moris* prevail. There indeed, one year with another, fully an eighteenth part of the inhabitants annually perish; but in other districts, where these dreadful causes of disease do not exist, the mortality is not more than one in 37 or 38.

The endemic diseases are either bilious, putrid, or inflammatory, as the seasons are hot and wet, or dry and cool. Thus, in the summer and autumnal months, or that portion of the year which includes the rainy and warm season, remittent fevers, dysenteries, slight colics, cholera morbus, phrenetic complaints, or what the French call *Coup de Soleil*, occasioned by the intense solar heat, ulcers of the legs, particularly those of the herpetic kind, are the most prevalent disorders. And in the marshy districts at this time of the year, obstinate and irregular intermittents, generally depending on glandular obstruction and visceral inflammation, remittents of the worst kind, and hepatic dysenteries, are very common, frequently epidemic, and too often fatal. During the winter and spring, when northerly winds blow, and occasion an uncommon and disagreeable chillness; but when the atmosphere is generally less moist than at any other time of the year, pleurifics, often attended with fever, catarrhal

tarrhal fevers, rheumatic fevers, ophthalmias, inflammatory anginas, erysipelas frequently preceded by fever, chronic rheumatism, and the Guinea-worm,* are among the most common epidemics.

* It will appear singular to the European reader, that the dracunculus, or Guinea-worm, should be classed among the epidemics of Grenada; but however strange it may seem, it is nevertheless fully established by innumerable facts. One very extraordinary instance will suffice to show the propriety of considering this disease as one of the epidemics of the dry season. On the estates of Edmund Thornton, Esq. situated in the district of St. George's parish, called Point Saline, already described, and at the farthest extremity of it, the negroes are attacked regularly every year, about the beginning of November, with symptoms of the Guinea-worm. In the month of January the disease spreads throughout the greatest part of the gang; and in the month of March it entirely disappears: and they continue exempted from it till the following November. The cause of this singular disease on the estates I have mentioned, seems to be confined to the water of some wells, which have been dug in the substance, called Tuf, of which the whole gang drink; there being no springs or rivulets in the district, and unfortunately no cisterns to collect and preserve the rain water. This has been rendered evident by what has happened on some neighbouring estates; the negroes of which, till of late, were as subject to this distressing complaint as those belonging to Mr. Thornton. The wells were filled up, cisterns built, or wells dug in places not subject to the influence of the flow and ebb of the tide; and at the return of the usual period of the appearance of the Guinea-worm, nothing of the kind happened. They have ever since (three years now) continued exempted from the disease. In the water which contains the embryos of the dracunculi, the naked eye distinguishes innumerable animalcules, darting in every direction with astonishing force and rapidity;

V epidemics. At all seasons, hepatic inflammation is very frequent; and when anomalous, always epidemic. Worms also are common throughout the year, and frequently give rise to very extraordinary symptoms. The yellow fever (properly so called) sometimes appears; but observes no particular season. Ruptures, ring-worms, elephantiasis, the glandular disease of Dr. Hendy, hydrocephalus, yaws, putrid or ulcerous sore throats, mortification of the fingers and toes, chronic aphthæ, leprosy, and tetanus, may be ranked among the sporadic endemics of this country, and are certainly not the least tremendous of them; but fortunately they are either confined to the negro race, or rarely occur. The species of tetanus peculiar to infants, and thence called *Trismus Nascentium*, is an endemic of this

rapidity; these, on being subjected to examination in a small microscope, exhibit a very extraordinary figure, differing from any animalcules hitherto described. Till within these few years, this disease was considered as peculiar to that part of the coast of Guinea contained between Cape Coast Castle and Accra, about ninety miles in extent: and it was believed that the slaves from the Gold Coast were alone subject to it, and always brought it with them to the West Indies, but never contracted it there. This however has been proved to be without foundation; for the Creole-negroes are as subject to it as the Africans. Infants have it as well as the most aged; and no part of the body or extremities is exempted from it: the arms, legs, every part of the trunk, the scrotum, penis, and even the pudenda muliebria, within the labia.

island,

island, and always a fatal one: it prevails only in the marshy and moist parts of the island, and takes place any time before the ninth day after birth; after which period it has never been known to happen. It does not appear to arise from a retention of the meconium; for however carefully infants have been evacuated, the disease has in no instance been thereby prevented. From its prevalence in moist, cold, or marshy situations, we may with more propriety attribute it to cold and impure air. This dreadful malady admits of no cure; but we fortunately possess a most certain preventive. It is with singular pleasure I assign the discovery of this beneficial application to my worthy and experienced friend Dr. John Stewart, of this island. About five or six years ago, on an estate which this gentleman had the charge of, the manager frequently mentioned to him the unfavourable circumstance of all the infants born on it dying of the locked jaw before the ninth day, and that this had uniformly been the event in every instance for many years, although every possible caution had been taken to prevent it. The plantation was situated in a valley, and consequently damp; but in all other respects healthy. Observing that the negro midwives were not very nice in their choice of the instrument with which they cut the umbilical cord,

cord, he suspected that the rubiginous particles might produce such irritation as to cause the fatal disease in question. Having this in view, he directed the midwives to dress the part with a folded piece of soft linen, well soaked in spirit of turpentine, instead of the common way. They attended to his directions: and not a single infant has died on the estate since. The practice, in situations wherein this disease has occurred, has become general, and has been attended with success in every instance. It may not be useless to add, that several planters, both here and in Tobago, make use of this application to lambs, calves, and colts, with equal success. As many of these animals die soon after they are dropped in moist and marshy situations of this country, the adoption of this simple preventive may be a general benefit to the inhabitants.

The island is frequently visited by the small-pox, sometimes of the confluent or malignant kind. It has in almost every instance been introduced from the coast of Africa, in the slave-ships; on board of which it frequently breaks out, and commits dreadful ravages on the passage to the West Indies; but as inoculation is always had recourse to at the time, or soon after this disease appears, the mortality occasioned by it is seldom considerable. The chicken-pox is common

mon almost every year; and as it appears without any evident introduction, it may be considered as more an endemic than a foreign disease. It is always mild, and requires no other treatment than a laxative at the turn, or when the pustules dry.

The measles and hooping cough seldom appear here; for in the course of ten years I recollect only two instances of the former, and one of the latter: they were of a very bad kind, and proved fatal to many children.

No instance, as far as I have been able to learn, has occurred of a bite or sting of any poisonous reptile, snake, or serpent; and indeed of the latter there are only two kinds found, both of which are said to be harmless. Scorpions, scolopendras, a large species of spider called *Tarantula*, and two or three species of wasps, are sometimes troublesome, and by their stings occasion painful inflammations; but are never poisonous. The sting-rays very frequently inflict very dangerous wounds; and the prickles of the sea-eggs, often unperceived, give the unwary a shock as violent and unexpected as that of electricity. The little wounds they inflict, though not dangerous, are exceedingly troublesome and painful. The negroes make use of a very simple method of extracting these prickles; they place the patient's

tient's foot over a fire as close as possible, without burning, and when it is sufficiently heated, they rub it well with candle-grease, and repeat the operation three or four times; they then wrap it up, and a few hours after, the prickles fall out. The pain ceases after the first application of the heat and grease.

I have already observed, that Grenada surpasses almost all the Windward and Leeward islands in the abundance and goodness of its water. I may add, that it also excels in its medicinal springs: some of these are hot, but the greatest number are cold. Of the former the most noted are those of Duquesne Valley, situated in the parish of St. Patrick. The temperature of the hottest of these springs is 116 degrees; and from their habitudes with precipitants, compared with Bergman's Analysis,* they appear to contain a considerable portion of iron, magnesia, a mineral alkali, and common salt. Aerated acid is not indicated by lime-water, or the blue flowers of the vervein. Their smell is pretty much hepatised; from which, and their heat, it is probable they contain a small portion of sulphur in a very volatile state. They have been used frequently internally and externally, with considerable advantage in chronic rheumatisms, herpetic com-

* Bergman's Chemical Essays, vol. i.

plaints, old ulcers, scrophula, and leprosy; but they rise in a country so extremely rugged, and unfortunately so little attention has been paid to the road or path which leads to them, that much general benefit cannot be expected from them. Of the cold medicinal springs, the most remarkable are those of Montrose and the Hermitage, in the parish of St. Patrick; and those of Beaugency, in St. George's parish. The temperature of all these is 78 degrees; and from their habits with precipitants, they appear (particularly the two former) to contain a large portion of vitriolated magnesia and a mineral alkali. The Beaugency water appears to be true Seltzer, containing a much larger portion of aerated acid than the former. Besides these springs, there are found in a few places, particularly on the Hermitage, mephitic exhalations, of a most pernicious nature. The Hermitage vapour issues from a small hole in the side of a rising ground, within a few yards of the river Antoine: no water rises with it, but in issuing it makes a singular hissing noise. Around the opening from whence this stream of mephitic air comes, a number of birds, lizards, and other small animals are found dead; and experiments have been made which prove its deadly influence on dogs and fowls.

The

The year in the West Indies is divided into two portions; the one called the Dry, the other the Wet Season. Some divide each of these also into two; which they call the Long and Short Winter, and the Short and Long Summer. The latter division has been made by the French; but as it is not always observable, it will be sufficient barely to have mentioned it. What is generally understood by the expression Dry Season, is the portion of the year contained between the beginning of December and the end of April. The commencement and termination, however, of this season are not always observed to happen at those periods; for the rains may continue till the beginning of January, recur frequently during the vernal months, and set in again at the beginning of April; or not appear till June or July. It is fortunate, however, for the planter, that these deviations from the usual course of the season seldom occur; for, when they do, their effects are often fatally experienced on the extent of the crops. The dry season, in its ordinary course, is pleasant and healthy, the sky exhibiting a vast expanse of azure, uninterrupted by clouds or any dense medium, and the atmosphere being pure, dry, and temperate. It is almost constantly ushered in by northerly, or north-westerly winds, and these and north-easterly winds

winds prevail with little variation the whole of its continuance; but are most chilly, dry, and boisterous in the months of December, January, and February. If however the wind, during this season, should in the day time blow from any other point but those I have mentioned, it always towards the close of evening returns to a northerly point. Thus it sometimes happens in extraordinary years, that from 6 A. M. to 7 or 8 P. M. the wind is from a point between S. and E. or S. and W. but, at the latter hour, it suddenly veers round to the northward, and continues so till the following morning, when it again changes to the southward. The total suspension of vegetation during this season is surprising, and seems to be occasioned by the want of moisture, and the exiccative shrivelling quality of the northerly winds. That it is to be attributed chiefly to the latter is evident, from the inefficacy of the rain which sometimes falls very plentifully in the dry months, in exciting a spring in vegetables: when, however, they are longer continued than usual, their vegetative power faintly discovers itself; but is never permanent. All deciduous trees are stripped of their leaves; the pastures become parched and brown; the cane-fields lose their vivid green, and assume the autumnal hue of northern climes. The latter

months of this season are the most pleasant of the year; Nature beginning to recover from the torpor in which she had been sunk, gives new life to the whole vegetable creation; and so great is the vegetative power displayed at this period, that leaves and blossoms are seen shooting forth on the same tree, with fruits already formed, and fast approaching to maturity. Nothing can equal the delightful freshness of the mornings, and the softness of the evenings of April and May, in this season. The atmosphere is dry, cool, and saturated with the perfume of a thousand blossoms; verdure is universal, and tempered with the softest tints of spring; the winds are gentle and soft, and never charged with the sultry heats of July.

The rainy season includes the summer, autumn, and generally the first month of winter; its approach is awful, and always indicated by thick fog resting on the tops of the higher mountains: this is soon followed by heavy, black, watery clouds, slowly rolling along from the north-east, in terrific volumes, enveloping the mountains, and darting bright electric coruscations from their edges. These clouds, sometimes bursting in the mountainous tracts, are suddenly converted into torrents of water, which frequently, inundating the country below, commit considerable
devastation

devastation in their progress; a body of water, not unfrequently six feet high, rolling down the beds of the rivulets, carries every thing before it, and discolours the sea several miles in every direction from their mouths, with the ochry earth of the interior country. But although this portion of the year is called the rainy season, to distinguish it from that just described, we are not to imagine that it is composed of a continued series of rainy weather, comfortless, gloomy, and never brightened by the cheerful rays of the sun. Many successive days occur of dry weather; and it sometimes happens, that the length of time without rain endangers the success of the planters exertions. These dry tracts chiefly occur in August and September, and are almost unupportably sultry and close. The rain falls in astonishing quantities;—but as I unfortunately possessed no means of measuring it, I cannot with precision say what the average quantity is: no idea however can be formed of it from what falls in Europe. During the rainy season, southerly, easterly, and westerly winds prevail, and are always hot and sultry.

The months of March and September, when the equinoxes happen, are particularly stormy; the winds are uncommonly boisterous, but generally unaccompanied with rain. Gusts such as

are every autumn and spring experienced in the continent of North America, are never known to happen here ; and hurricanes, which often lay waste the sister colonies to the northward, seldom occur in Grenada ; or if they do, they are little more violent than common gales of wind. The dreadful hurricane of the year 1780, which proved so destructive in Jamaica, Barbadoes, Antigua, Dominica, St. Vincent, and the French islands, did no other damage here than throwing down some trees, and a few old buildings. A few neutral vessels indeed were drove ashore in the carenage ; but it was an event to be attributed entirely to the negligence of their captains.

The regular succession of sea and land breezes, so constantly observed in the larger islands, and on the continent, never occurs here ; but there are two periods in the twenty-four hours, during which there is a perfect calm, and consequently a very disagreeable oppressive heat, from eight till ten in the morning, and from two till four in the afternoon.

That northerly and easterly winds are the most prevalent, is demonstrated by the manner in which all the trees on the eastern side of the mountains are bent : they are all, particularly those growing on the most exposed situations, stunted and dwarf ; and their branches are inclined

clined to the south-west. Next to these is the southerly; and the least frequent is the westerly.

Lightning, and its consequent thunder, are phenomena not so frequent in Grenada as the situation of the island and its high conical mountains might induce us to expect; nor are the flashes and the explosions so tremendous, by any means, as they are in the southern states of North America. It seldom happens that lightning is the cause of much mischief here; for in the course of twelve years, I know of only two instances of its mischievous effects. In the dry season they never occur: they are generally preceded by whitish clouds hanging on the sides and tops of the mountains, in the form of huge bales; and fleecy clouds dispersed in various forms throughout the sky. Southerly winds accompany them generally.

The thermometer I used is a mercurial one, graduated by Farenheit's scale, and made by Frazer, London. The hall in which it hung is reckoned one of the coolest rooms in St. George's, situated on the summit of the part of the town called The Hill: it was almost constantly exposed to a current of air, which passed between the door and one of the windward windows; and the height of the mercury in the tube was almost always taken at 7 A. M. at 1 P. M. and

at 10 P. M. The choice of these periods in the twenty-four hours, arose from my observation of the following fact : At 7 A. M. the heat begins to increase, and continues to do so till 1 P. M. ; from which time till 4 P. M. it is stationary : it then begins to diminish, and continues to do so till about 10 P. M. ; from which time till 7 A. M. it is again stationary. This routine of temperature is disturbed only when any remarkable change takes place in the atmosphere, such as much rain, attended with strong wind ; and during some part of the dry season, when, as I have already observed, south-easterly winds are succeeded at night by northerly ones. Thus, from the latter cause, the thermometer sinks in the course of the night two, three, or four degrees ; so that when it is 80 at 10 P. M. it will be only 76, 77, or 78, at 7 of the following morning, in January, February, and March. A fall of rain, accompanied with wind, has a very remarkable effect on the thermometer. The greatest change I ever observed was ten degrees ; the least four ; so that the medium may be about seven degrees. These changes are most frequent in the summer and autumnal months, when the rains fall in greatest abundance ; and when there is often an alternate succession of rain with cold, and dry weather with heat. It may not be unnecessary

neceſſary to obſerve, however, that during rain, ſhould the atmosphere remain ſtill, the thermometer continues at the ſame height as before it began to rain. I have repeatedly obſerved this, even when the quantity of rain has been very conſiderable; and it is a phenomenon which ſhould not ſurpriſe us, ſince we know the great ſhare which winds, or currents of air, have in evaporation, and this in the production of cold.*

When I have expoſed the thermometer to the direct rays of the ſun, in an incloſed yard, where the wind could have little effect upon it, the mercury has riſen in ten minutes to 130 degrees, or 42 degrees above its ſtationary point at noon, in the hall where the inſtrument was before ſuſpended; but as the reflection from the walls of the yard might conſiderably increaſe the heat, I did not conſider this as a fair trial of the natural heat of the ſun. I have therefore frequently, on clear days, ſuſpended the thermometer in a gallery, directly expoſed to the ſun's rays, and found that the mercury roſe to 113 degrees, and once to 120 degrees at noon, or generally about 30 degrees above the uſual height in the ſhade at noon.

Another thing to be obſerved, is the difference between the heat of the air at the hotteſt time

* See Eſſays and Obſervations, Phyſical and Literary, vol. ii. p. 159.

of the day, and during the night; or the periods during which the thermometer is generally stationary. The medium of the heat in the shade at noon, or 1 P. M. is about 83, 30; at night 74; so that in general the difference is about 9 degrees. I have not found that the degree of heat in the ground, and first floors of my house, differed much from that in the upper, which was covered with a tiled roof; and consequently the air contained in it we would expect should be more affected by the heat of the sun than the lower floors. In general, this difference has never exceeded 1 degree.

I may here take notice of the difference of temperature produced in water, by the heat of the atmosphere, during the day and night. It shews how extremely sensible the human body is to the smallest deviation, from the usual heat it is exposed to; and that our sense of cold, in this climate, is merely relative. At 10 P. M. into a Spanish unglazed earthen gullet (of that kind generally used here for cooling water) full of water, I plunged a small thermometer: in five minutes the mercury sunk 3 degrees, its stationary point then, in the open air, being 82 degrees. I then placed the gullet in an open window, where it was left till 6 A. M. On plunging the thermometer into the water, the mercury
sunk

funk to 72 degrees, or 10 degrees lower than its stationary point during the night. This degree of coolness in the water was, to my taste, rather cold and chilling. At 1 P. M. I plunged the thermometer into a guglet of water which had been standing in the shade all the forenoon, when the mercury fell to 82 degrees, or 2 degrees lower than the heat of the room at that time. It is to be observed, that the guglets used here, for the purpose of cooling water, are brought from South America, are porous, and of course a considerable evaporation takes place from all their external surface.

It is not at all surprising that this country should be subject to earthquakes. The conical hills and mountains into which the surface of the island is divided; the lakes* contained in what have every appearance of having been once the craters of immense volcanos; the regular horizontal strata of the substance called Tuf,

* One of these, called the Grand Etang, or Great Lake, to distinguish it from another on the windward side of the island, is situated in a circular basin, cut out of the summit of the highest mountain of the island. It is about a mile in circumference; and its depth is, in general, about 14 feet. The other, called the Lake of the River Antoine, retains the appearance of an extinguished volcano, much more perfectly than the Grand Etang. The hollow which contains it is perfectly circular, and gradually slopes from the brim to the edge of the water, which is of very considerable depth.

which

which seems still to retain many of the distinguishing marks of lava ; these and several other peculiarities to be observed in the structure of this as well as most of the windward islands, give us room to believe that volcanos did once exist in them ; and we know that where volcanos are, or have been, earthquakes are very frequent. In the course of the three first years of my residence in Grenada, there were five earthquakes. The first and most violent happened on the 22d of December, 1784, about 2 P. M. In St. George's it continued about a minute and a half, and ran from about N. N. W. to S. S. E. It shook the earth in a violent manner, and when strongest, occasioned an undulating motion of the surface. It was attended with a hollow rumbling noise, like distant thunder. The atmosphere was still and close whilst it lasted ; the thermometer 82. The sea did not appear to be in the least agitated. The marshes at Calivini were much agitated by it ; for the motion of their surface was perceived to be very great, and to continue some time after the shock ceased. On the windward side of the island, the shock continued about two minutes ; and was much more violent than in town. The captain of a ship, at that time off the coast of the island, said, the sensation which the shock occasioned, on board, was similar to that of the ship's

ship's bottom rubbing against rocks ; but that the sea was not agitated. The same was observed by some gentlemen going to Carriacou. On the 24th of April, 1785, about 40 minutes past six A. M. a shock of an earthquake was felt, which lasted only about two seconds ; but about 20 seconds after, a second was felt, which continued a little longer. It was very gentle, was not general, and appeared to run from N. N. W. to S. S. E. The morning was calm. On the 26th of May, about midnight, a shock was generally felt, running from about W. to E. ; it continued about 30 seconds, and shook the houses very considerably. On the 29th of the same month, about 10 P. M. another shock was generally felt, and continued about 20 seconds. And on the 16th of January, 1786, in the morning, three shocks were perceived running from N. N. W. to S. S. E. the two first were very slight ; but the third was violent. During the seven last years, not a single shock has occurred : an extraordinary circumstance, considering their frequency in the preceding years. In those islands, however, on which the volcanic appearances are more perfect than they are here, such as St. Vincent, St Lucia, and Dominica, earthquakes are much more frequent and violent.

Water-spouts are very rarely seen around Grenada ;

nada; for during the last ten years, I recollect only two.

The barometer does not appear to be affected much in this climate. A moist atmosphere, with southerly and westerly winds, makes the mercury to sink a little; and northerly winds, with a dry cold atmosphere, make it rise. But notwithstanding the irregularity of temperature, and the moisture which prevails more or less throughout the whole year here of the atmosphere, the greatest range of the barometer during any year, has not exceeded one inch and five-tenths. This is, however, considerably greater than that which happens at Barbadoes, where the greatest range is not more than half an inch. In uncommon years, when a long continuance of northerly winds produces a degree of cold in the atmosphere extremely disagreeable to our feelings, the barometer has stood for a month together at 30 degrees. In the months of July and August, when much rain falls, it has continued at 28 : 5 several days successively; and the atmosphere then is insufferably close.

I have already mentioned, that it was not in my power to determine the quantity of rain, owing to my not being possessed of the proper instruments; but with a view to remedy this defect, I have, following the example of the late

Dr.

Dr. Cleghorn in his account of the weather at Minorca, marked the rainy days, and the proportion they bore to each other, by dots. Thus, drizzling rain is denoted by ·, showery by ··, heavy rain by ···, and excessive rain by ····

Having premised these general observations on the face of the country, on the productions, on the endemial diseases, and on the weather of Grenada, I shall now proceed to describe the changes which took place in each month of the years 1784, 1785, 1786, and 1793; and subjoin a table of the highest, lowest, and medium height of the thermometer during that time.



1784.

JANUARY. My observations on the weather commenced on the 22d, from which, till the end of the month, the weather was in general dry; the atmosphere too was clear, pure and agreeably warm.

Rainy days, 25th, 30th, and 31st ..

Wind, {	8 days Northerly.	Therm. H. 85	} M. 83
	2 days N. E.	L. 81	

FEBRUARY. Although this month began with heavy rain, yet it was generally dry, and in temperature similar to the last.

Rainy

ceding month. Much thunder and lightning towards the middle and end of the month.

Rainy days, 1, 2, 3, and 4 . . . 10, 11, 12, and 15 . . . from
19 to 30

Wind, $\left\{ \begin{array}{l} 23 \text{ days Southerly.} \\ 7 \text{ days Easterly.} \end{array} \right.$ Therm. H. 87 } M. $84\frac{3}{4}$
L. 82 }

JUNE. Excepting a few days about the middle, the whole of this month was also rainy, attended with considerable variations of the thermometer, the mercury during rain falling to 76 as on the 25th, and rising afterwards to 84.

Rainy days from 1 to 10' from 11 to 17. 17, 18
from 20 to 25 30

Wind, $\left\{ \begin{array}{l} 17 \text{ days N. E.} \\ 14 \text{ days Easterly.} \end{array} \right.$ Therm. H. 86 } M. 85
L. 84 }

JULY. The greatest part of this month like the last, only towards the middle much boisterous wind from S. E. E. and N. E. Several days atmosphere still and suffocating. Some thunder and lightning.

Rainy days, 1, 2, 3, 4, 6, 7, 8, 9, 10, 17, 18, 20, 21, 22, 23, 24,
30 . . . 12, 19, 25, 26, 27, 28 . .

Wind, $\left\{ \begin{array}{l} 11 \text{ days N. E.} \\ 12 \text{ days Southerly} \\ 8 \text{ days Easterly.} \end{array} \right.$ Therm. H. 87 } M. $84\frac{1}{2}$
L. 82 }

AUGUST. Except two or three days, this month was remarkably rainy, with scarcely any wind, and consequently very great heat. Much thunder and lightning.

Rainy

Rainy days, the whole except 5, 6, 21, 27, . . .

Wind, $\left\{ \begin{array}{l} 27 \text{ days N. E.} \\ \text{almost calm.} \\ 4 \text{ days S. E.} \end{array} \right. \text{Therm. H. } 88 \left. \begin{array}{l} \\ \\ \text{L. } 84 \end{array} \right\} \text{M. } 85\frac{1}{2}$

SEPTEMBER. This month, like August, had only a few days dry weather; and the thunder and lightning were infinitely more tremendous. On the 2d the lightning, being particularly frequent and sharp, struck the powder magazine of Richmond Hill fort, damaged the work very considerably, and killed four soldiers of the 60th regiment.

Rainy days, 2, 9, 11 3, 4, 5, 6, 10, and from 12 to 30 . .

Wind, 30 days Easterly. Therm. H. 86 } M. 83 $\frac{1}{2}$
L. 81 }

OCTOBER—Was rainy also, and in general calm. No thunder or lightning.

Rainy days, from 1 to 6, from 9, to 14, and from 21 to 25 . . 7,
and from 15 to 19 . . . 8, 20 . . .

Wind, $\left\{ \begin{array}{l} 11 \text{ days N. E} \\ 10 \text{ days Southerly.} \\ 10 \text{ days Easterly.} \end{array} \right. \text{Therm. H. } 88 \left. \begin{array}{l} \\ \\ \text{L. } 82 \end{array} \right\} \text{M. } 85$

NOVEMBER—Was much the same, but without heavy rain.

No account taken of the rainy days.

Wind, 30 days Northerly. Therm. H. 84 } M. 83
L. 82 }

DECEMBER. This month in general pleasant and temperate during the day; but the sudden change

change in the temperature of the air during the night, rendered that season disagreeable. Thermometer generally fell to 74 degrees in the night. Earthquake on the 22d.

Rainy days, 4, 5, 12, 13, 14, 19, 22, 25, 28, 30, 31 .. 23, 24...

Wind, $\left\{ \begin{array}{l} 28 \text{ days N. E.} \\ 3 \text{ days S. W.} \end{array} \right.$ Therm. $\left. \begin{array}{l} \text{H. } 84 \\ \text{L. } 78 \end{array} \right\} \text{M. } 82\frac{6}{31}$

1785.

JANUARY. This year began with rain; a circumstance very uncommon. The atmosphere, though generally clear, was cool.

Rainy days, 4, 5, 6, 8, 9, 10, 11, 12, 16, 18, 20, 22, 24, 26, 28, 30 ..

Wind, 31 days Northerly. Therm. $\left. \begin{array}{l} \text{H. } 82 \\ \text{L. } 80 \end{array} \right\} \text{M. } 80\frac{1}{2}$

FEBRUARY. Except one day, the whole of February was dry, with sometimes a fultriness in the day-time, and chill during the night, but especially towards morning.

Rainy day, 8 ..

Wind, $\left\{ \begin{array}{l} 26 \text{ days Northerly.} \\ 2 \text{ days Westerly.} \end{array} \right.$ Therm. $\left. \begin{array}{l} \text{H. } 85 \\ \text{L. } 82 \end{array} \right\} \text{M. } 82\frac{2}{8}$

MARCH. The first ten days were dry and agreeable; the rest in general rainy, with boisterous northerly winds towards the end. Atmosphere loaded with vapour.

Rainy days, 11, 14, 15, 16, 22, 24, 25, 27, 28, 29 .. 26...

Wind, $\left\{ \begin{array}{l} 16 \text{ days N. E.} \\ 11 \text{ days N. W.} \\ 4 \text{ days Easterly.} \end{array} \right.$ Therm. $\left. \begin{array}{l} \text{H. } 85 \\ \text{L. } 83 \end{array} \right\} \text{M. } 83\frac{1}{2}$

APRIL—Was in general dry, but excessively windy from the eastward.

Rainy days 14, 30 19, 23, 24, 25, 26 ..

Wind, { 3 days Northerly. Therm. H. 85 } M. $81\frac{1}{8}$
 { 27 days Easterly. L. 80 }

MAY—Was generally rainy, with boisterous gales from N. E. and E. Atmosphere loaded with vapour, and frequently hot and suffocating. Towards the end of the month two earthquakes, and some thunder and lightning.

Rainy days, 1, 2, 3, 4, 24, 25, 26 . . . 5, 6, 9, 10, 11, 14, 15,
 16, 20, 21. 22, 23 ..

Wind, { 6 days Northerly. Therm. H. 87 } M. $84\frac{1}{2}$
 { 22 days Easterly. L. 83 }
 { 3 days calm

JUNE. This month was frequently wet, warm, and squally, particularly about the middle, with some thunder and lightning.

Rainy days, 1, 4, 5, 10, 11, 16, 21, 30 . . . 6, 7, 8, 17, 18, 20,
 22, 23, 24, 27 ..

Wind, { 1 day Northerly. Therm. H. 87 } M. $84\frac{5}{8}$
 { 29 days Easterly. L. 81 }

JULY. For the most part rainy, calm, and sultry, with frequently thick fog.

Rainy days, 8, 11, 14 . . . 4, 9, 10, 12, 15, 16, and from 21
 to 31 ..

Wind, { 2 days S. W. Therm. H. 86 } M. $84\frac{2}{3}$
 { 28 days Easterly. L. 84 }

AUGUST. Few days of this month were rainy. The weather, particularly at the beginning and
 towards

towards the end, was remarkably dry, calm, and sultry, with a great deal of thunder and lightning, unaccompanied with rain.

Rainy days, 6, 10, 25, 26 . . .

Therm. on the 24th, 83 ; on the 26th, 73.

Wind, {	6 days S. W.	Therm. H. 83 L. 78	} M. $80\frac{2}{3}$
	15 days Easterly.		
	10 days calm.		

SEPTEMBER—Began with dry serene weather ; but after the first week it suddenly changed to the most tempestuous since January, 1784, and continued so till the end of the month. The wind frequently blew from almost every point of the compass, attended with thunder and lightning, and such prodigious falls or rather floods of rain, as overflowed the low lands, and did very considerable damage. The thermometer too varied very much. It was twice at 89 degrees, and once at 90, and, at one time, as low as 78 degrees at noon.

Rainy days, 9, 10, and from 12 to 27 28, 29, 30 . .

Wind, {	11 days Easterly.	Therm. H. 90 L. 78	} M. $86\frac{4}{5}$
	19 extremely variable and violent.		

OCTOBER—Was altogether rainy, cloudy, and chilly. On the 8th the mercury sunk to 74 degrees at noon.

Rainy days, 8 the rest . .

Wind, {	12 days Northerly	Therm. H. 85 L. 74	} M. 80
	2 days S. W.		
	17 days Westerly.		

MARCH. The former part of the month much the same also; the latter warmer, with the wind more southerly.

No account taken of the rainy days.

Wind, { 14 days Northerly. Therm. H. 86 } M. 84
 { 17 days Southerly. L. 83 }

APRIL. The first part of the month rainy and windy; the latter warmer and drier, but equally windy from N. W. W. and S. W.

No account taken of the rainy days.

Wind, { 10 days Northerly. Therm. H. 86 } M. 84½
 { 11 days Southerly. L. 83 }
 { 9 days Westerly.

MAY—Began with dry pleasant weather; but in general it was very variable, with lowering clouds from the N. E, and fog on the tops of the mountains.

No account taken of the rainy days.

Wind, { 25 days Northerly. Therm. H. 86 } M. 84½
 { 6 days Easterly. L. 85 }

JUNE. A few days of the beginning pleasant; from the 8th to the 17th, variable; afterwards till the 27th, almost constant heavy rain, with heavy black clouds from the N. E. The rest of the month pleasant.

Rainy days, 9, 10, 12, 15, 16, 17 .. from 18 to 27 ...

Wind, { 16 days Easterly. Therm. H. 89 } M. 85
 { 14 days S. E. L. 77 }

JULY. Almost the whole of the month of July very rainy, warm, and sometimes suffocating.

ing. On the 6th, in the morning, when dry, thermometer 80; at noon, when very heavy rain fell, 76; soon after, 84; and, late in the evening, stationary at 82.

Rainy days, from 1 to 4, 9, 10, 12, 13, 15, 16, 20, 21, 23, 24,
25, 26, 27, 28, 29, 30, and 31 .. 6, 17, 18,
19, 22 5, 7 . . .

Wind, $\left\{ \begin{array}{l} 8 \text{ days Northerly.} \\ 8 \text{ days Southerly.} \\ 15 \text{ days Easterly.} \end{array} \right. \quad \text{Therm. H. 88 } \left. \begin{array}{l} \\ L. 76 \end{array} \right\} \text{M. } 87\frac{3}{4}$

AUGUST—Was altogether rainy; but towards the end the rain fell in prodigious quantity, and accompanied with a great deal of thunder and lightning, and squalls of wind from S. E.

Rainy days, 1, 3, 4, and to 20 .. 25, 26, 27 .. 2, 21 to 24 . . .
28, 29, 31

Wind, $\left\{ \begin{array}{l} 23 \text{ days Southerly.} \\ 3 \text{ days Easterly.} \end{array} \right. \quad \text{Therm. H. 87 } \left. \begin{array}{l} \\ L. 78 \end{array} \right\} \text{M. } 82\frac{2}{3}$

SEPTEMBER. The violence and long continuance of the heat, and the almost constant dryness of the weather during this month were so uncommon, that men who had lived upwards of forty years in Grenada, and the other West India islands, could not recollect any year equally remarkable. On six days the thermometer rose to 90; on fifteen to 89; and on three to 88.

Rainy days, 2, 4, 13, 19, 30 .. 3, 17 . . .

Wind, $\left\{ \begin{array}{l} 14 \text{ days Southerly.} \\ 9 \text{ days Easterly.} \\ 5 \text{ days Westerly.} \\ 2 \text{ days calm.} \end{array} \right. \quad \text{Therm. H. 90 } \left. \begin{array}{l} \\ L. 84 \end{array} \right\} \text{M. } 88\frac{1}{2}$

OCTOBER.

OCTOBER. The first week of this month was exactly similar to the whole of the last; but afterwards there was much rain, with gusts of wind, and sometimes thunder and lightning. More rain fell during the night than at any other time; and then, particularly towards the end of the month, we had excessive boisterous south-easterly wind.

Rainy days, 5, 10 11, 12, 13, 14 . . . 15 to 18, and 20 to 24 . .
9, 24 to 31

Wind,	{	1 day Northerly.	Therm. H. 90
		10 days Southerly.	
		11 days Easterly.	
		8 days Westerly.	

NOVEMBER—Began with heavy rain and boisterous south-easterly winds, which were more particularly so during the night; and then accompanied with thunder and lightning. The rest of the month, except a few days about the middle and end, was dry and tolerably pleasant.

Rainy days, 1, 3, 4, 7, 16, 17, 25, 26, 27 . . . 2, 5, 6

Wind,	{	1 day Northerly.	Therm. H. 88 L. 78 } M. 83
		12 days Southerly.	
		13 days Easterly.	
		4 days Westerly.	

DECEMBER—Was in general rainy, and sometimes extremely tempestuous; N. W. and N. E. winds chiefly prevailing, occasioned a disagreeable coolness in the air, which was most remarkable during the nights and mornings.

No account taken of the rainy days.

Wind, { 15 days Northerly. Therm. H. 86 } M. $84\frac{2}{3}$
 { 14 days Easterly. L. 77 }
 { 2 days Westerly.

1793.

JANUARY. Generally rainy with northerly winds.

No account taken of the rainy days.

		Morn.	Noon.	Even.
Therm.	H.	81	89	83
	L.	77	83	78
	M.	79	86	$80\frac{1}{2}$

FEBRUARY. Generally rainy (an uncommon circumstance), with north-easterly winds.

No account taken of the rainy days.

		Morn.	Noon.	Even.
Therm.	H.	82	88	82
	L.	77	81	77
	M.	$79\frac{1}{2}$	$84\frac{1}{2}$	$79\frac{1}{2}$

MARCH. The first few days showery; afterwards mild and pleasant, with easterly and southerly winds.

No account taken of the rainy days.

		Morn.	Noon.	Even.
Therm.	H.	80	87	82.
	L.	79	80	76
	M.	$79\frac{1}{2}$	$83\frac{1}{2}$	79

APRIL. Very little rain, and more mild than March.

No account taken of the rainy days.

		Morn.	Noon.	Even.
Therm.	H.	82	87	82.
	L.	78	84	78.
	M.	80	$85\frac{1}{2}$	80

MAY.

MAY. Dry and dusty till the 16th, afterwards rainy; and on the 30th thunder and lightning for the first time. Wind generally S. E.

Rainy days, 16, 24 from 16 to 24, and from 29 to 31 . . .

		Morn.	Noon.	Even.
Therm.	H.	82	87	84
	L.	79	80	80
	M.	80½	83½	82

JUNE—Was, three or four days excepted, rainy throughout, with frequently heavy squalls from the S. E. and much thunder and lightning.

Rainy days, 1, 2, 8, 9, 15, 16, 17, 21, 27, 28 . . . 3, 4, 5, 11,
13, 19, 20, 30 . . 10, 14, 22, 26, 29 . . .

		Morn.	Noon.	Even.
Therm.	H.	82	87	82
	L.	77	77	77
	M.	79½	82	79½

JULY,—Till about the 11th, was dry, but squally from the eastward. The rest of the month rainy, with north-easterly winds, and much thunder and lightning; mountains generally enveloped in fog, and atmosphere loaded with vapour.

Rainy days, 4, 5, 6, 15, 17, 22, 23 . . 13, 16, 3 . . . 11, 19,
20, 21, 24, 26, 27, 30 . . .

		Morn.	Noon.	Even.
Therm.	H.	81	88	83
	L.	77	77	78
	M.	79	82½	80½

AUGUST. Very little rain fell during this month; but the atmosphere was generally excessively

cessively close, sultry, and loaded with vapour. The winds were very variable; but for the most part a calm. Some thunder and lightning.

Rainy days 21, 29 .. 10, 11, 20, 26 ... 22

		Morn.	Noon.	Even.
Therm.	H.	82	89	85
	L.	78	80	79
	M.	80	84½	82

SEPTEMBER. The greatest part of this month remarkably rainy, attended frequently with most vivid lightning and tremendous thunder, and violent squalls from the S. E. The heat was very variable; and on the 5th, greater than I ever observed it. At 11 A. M. the mercury rose to 88; at 1 P. M. to 92; at 4 P. M. it fell to 89; and at 10 P. M. to 84. As this heat was not attended with rain, and as no clouds interposed, every living creature was oppressed in an uncommon degree by it. The wind generally southerly.

Rainy days, 4, 12, 20, 23 .. 11, 16, 17, 30 ... 2, 3, 8, 13, 19, 27, 28, 29

		Morn.	Noon.	Even.
Therm.	H.	83	92	84
	L.	79	80	78
	M.	81	86	81

OCTOBER. Much rain fell this month also; but not in the violence of last month. Squally from S. E.; and some thunder and lightning.

Rainy days, 16, 22, 24, 27 .. 10, 11, 12, 13, 14, 23, 30 ...
17, 25, 30

		Morn.	Noon.	Even.
Therm.	H.	84	90	86
	L.	77	80	78
	M.	$80\frac{1}{2}$	85	82

NOVEMBER. Five days excepted, the whole of this month uncommonly rainy; the sky almost continually obscured by heavy, black clouds; and the mountains enveloped in white clouds. A great deal of thunder and lightning. The wind chiefly S. E.

Rainy days, 2, 15, 19, 20, 23 .. 4, 7, 9, 10, 14, 17, 21, and
from 24 to 29 ... 5, 6, 8, 11, 12, 13, 16, 22

		Morn.	Noon.	Even.
Therm.	H.	82	83	82
	L.	76	78	78
	M.	79	83	80

DECEMBER—Was also very rainy; and, contrary to the usual course of the seasons, southerly winds prevailed. No thunder or lightning.

Rainy days, 2, 3, 4, 12, 13, 17, 23, 26, 29 .. 21, 22, 25,
28, 30 ...

		Morn.	Noon.	Even.
Therm.	H.	81	88	82
	L.	77	80	77
	M.	79	84	$79\frac{1}{2}$

A TABLE, shewing the greatest, least, and medium Height of the Mercury in each Month of the Years 1784, 1785, 1786, and 1793, at St. George's Grenada.

Months.		1784.	1785.	1786.	1793.		
					7 A. M.	1 P. M.	10 P. M.
January.	H.	85	82	84	81	89	83
	L.	81	80	82	77	83	78
	M.	83	$80\frac{1}{3}\frac{6}{11}$	$83\frac{1}{3}\frac{1}{11}$	79	86	$80\frac{1}{2}$
February.	H.	85	85	84	82	88	82
	L.	81	82	82	77	81	77
	M.	83	$82\frac{1}{2}\frac{2}{8}$	83	$79\frac{1}{2}$	$84\frac{1}{4}$	$79\frac{1}{2}$
March.	H.	86	85	86	80	87	82
	L.	83	83	83	79	80	76
	M.	84	$83\frac{1}{3}\frac{9}{11}$	84	$79\frac{1}{2}$	$83\frac{1}{2}$	79
April.	H.	86	85	86	82	87	82
	L.	81	83	83	78	84	78
	M.	$83\frac{1}{2}$	$81\frac{1}{3}\frac{1}{10}$	$84\frac{1}{2}$	80	$85\frac{1}{2}$	80
May.	H.	87	87	86	82	87	84
	L.	82	83	85	79	80	80
	M.	$84\frac{2}{3}\frac{5}{11}$	$84\frac{1}{3}\frac{2}{11}$	$84\frac{1}{2}$	$80\frac{1}{2}$	$83\frac{1}{2}$	82
June.	H.	86	87	89	82	87	82
	L.	84	81	77	77	77	77
	M.	85	$84\frac{5}{3}\frac{5}{10}$	83	$79\frac{1}{2}$	82	$79\frac{1}{2}$

TABLE continued.

Months.		1784.	1785.	1786.	1793.		
					7 A. M.	1 P. M.	10 P. M.
July.	H.	87	86	88	81	88	83
	L.	82	84	76	77	77	78
	M.	$84\frac{1}{2}$	$84\frac{2}{3}\frac{1}{1}$	$87\frac{2}{3}\frac{1}{1}$	79	$82\frac{1}{2}$	$80\frac{1}{2}$
August.	H.	88	88	87	82	89	85
	L.	84	78	78	78	80	79
	M.	$85\frac{1}{2}$	$80\frac{2}{3}\frac{5}{1}$	$82\frac{2}{3}\frac{8}{1}$	80	$84\frac{1}{2}$	82
Septemb.	H.	86	90	90	83	92	84
	L.	81	78	84	79	80	78
	M.	$83\frac{1}{2}$	$86\frac{4}{3}\frac{0}{0}$	$88\frac{1}{3}\frac{1}{0}$	81	86	81
October.	H.	88	85	90	84	90	86
	L.	82	74	79	77	80	78
	M.	85	80	$87\frac{2}{3}\frac{4}{1}$	$80\frac{1}{2}$	85	82
Novemb.	H.	84	84	88	82	88	82
	L.	82	80	78	76	78	78
	M.	83	$81\frac{1}{2}$	$83\frac{2}{3}\frac{4}{0}$	79	83	80
Decemb.	H.	84	83	86	81	88	82
	L.	78	75	77	77	80	77
	M.	$82\frac{6}{3}\frac{1}{1}$	$81\frac{1}{2}$	$84\frac{2}{3}\frac{3}{1}$	79	84	$79\frac{1}{2}$

A TABLE of the WINDS.

Months.	1784.				1785.				1786.			
	Northerly.	Southerly.	Easterly.	Westerly.	Northerly.	Southerly.	Easterly.	Westerly.	Northerly.	Southerly.	Easterly.	Westerly.
Jan.	8		2		31				25		6	
Feb.	19	10			26			2	28			
Mar.	19	8	4		16		4	11	14	17		
Apr.	3	18	9		3		27		10	11		9
May		23	7		6		22		25		6	
June	17		14		1		29			15	16	
July	11	12	8				28	2	8	8	15	
Aug.	27	4					15	6		23	3	
Sept.			30		6	7	11	6		14	9	5
Oct.	11	10	10		12	2		17	1	10	11	8
Nov.	30				30				1	12	13	4
Dec.	28			3	10	20			15		14	2
Tot.	173	85	84	3	141	29	136	44	127	115	93	28

From the foregoing Table of the Winds it appears, that, taking the average of three years, the Northerly are to the Southerly and Easterly, as about 1 to 2; and to the Westerly, as about 1 to 7. And from the foregoing Table of the Height of the Mercury, it appears that the average heat of four years at Noon, is exactly 84 degrees.

Grenada, June 1, 1794.

The Origin, Progress, Diagnostic, Nature of the Cause, and other Circumstances peculiar to, or which favoured the Propagation of the Malignant Pestilential Fever, or which may be considered as illustrative of its Pathology.

THE ORIGIN AND PROGRESS OF THE FEVER.

The Origin of the Fever.

THE state of the atmosphere between the tropics, does not seem to admit of the generation of a high degree of contagion; and wherever such exists, it must arise from the most unpardonable neglect of cleanliness, and the retention

tention of contagious effluvia from a total want of ventilation. The peculiar circumstances of the atmosphere in hot climates, where due attention is paid to cleanliness and ventilation, must prevent infection; and it is probable, that it is only where there is not a sufficient number of people to render, by their exertions, the places they inhabit, clean and sweet, that infection takes place, and is retained. The observation made by Dr. Blane on this subject, is, in many respects, just; and may be confirmed by that of every intelligent practitioner in the West Indies. He says, “there is reason to think that the open air very soon dissipates and renders inert all infections of the volatile kind; and of course, the warmer the air is, the more readily it will have this effect. It is accordingly observed, that infection is much less apt to be generated about the persons of men, and that it adheres to them for a much less space of time in a hot climate than in a cold or temperate one.”* If infection, or rather the contagion arising from accumulated human effluvia, is produced only in situations wherein many are crowded together in a comparatively small space, it becomes a question of no small importance, why malignant and infec-

* Observations on the Diseases of Seamen, p. 277.

tious fevers are never, or very feldom, generated on board flave-fhips. In thefe the number is much greater than transports, or fhips hired for the purpofe of emigration, ever contain: the flaves, in order to prevent infurrection, are generally kept below, fometimes in irons, particularly during the night: the fmell between decks is intolerably offenfive to thofe not accuftomed to it. Infection, however, is prevented, where fo many caufes combine to produce it, by the following means: The crew of a flave-fhip is generally very numerous; whereby the rifk, fhould infurrection happen, is much leffened, and the attention to the flaves is proportionally increafed: the fpace between decks is regularly wafhed every day, if the weather permits: the flaves are, in parties of thirty or forty, taken on deck in fine weather, their irons taken off, and they are encouraged, by every poffible means, to exercife themfelves by dancing: they have no clothing to which infectious particles can adhere: their perfons are frequently wafhed: their diet is always compofed of vegetables, without any mixture of animal food, and feafoned highly with capficum: their drink is water: and fcuttles are cut in the fides of the fhip, by means of which, and windfails when they can be ufed, there is kept up a conftant change of air, and as free a ventilation as the

situation can admit of. But in every situation wherein the generation of infection is possible, the prevention of it is proportional to the degree of interest of those who have the direction and command. In ships of war, in merchant ships, in transports, and in ships hired for the purpose of emigration, the interest of those who command extends not beyond the operation of a sense of duty; of course we generally find it weak: it is rare, indeed, to meet an instance of the contrary; but where we do, the effect is conspicuous. In slave-ships, the profits of the captain and surgeon are more or less, according to the number brought to market and actually sold; hence their interest in their welfare is great, and their exertions to maintain it are proportional. It is disgraceful that "*querenda pecunia primum, virtus post nummos,*" should be in all ages the prevailing maxim of mankind.

In ships, therefore, in which the captains are not urged to prevent infection by motives of interest, fevers of a malignant and pestilential nature may be generated even in hot climates. A ship of this description introduced the very fatal fever which raged in the port and town of St. George's, during several months of the year 1793. The following account I was favoured with by Mr. Paiba, who was one of the adventurers in
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the Bulama Scheme, and who, despairing of success, left the coast of Africa in this ship. At the time this gentleman communicated the circumstances of the Hankey, I am about to state, the fever had prevailed already in the shipping to a most alarming extent, and had been marked with symptoms so uncommon, as required every aid from authentic information to develop its causes, and elucidate its nature. It had also been confidently stated, by men of observation and veracity, that many highly suspicious circumstances existed, all directing to the Hankey as the origin of the calamity. Already had many lost their lives by communicating with that ship:—already had infection been unequivocally traced to the pestilential feminia generated in contaminated bedding and wearing apparel contumaciously preserved in her:—already had the existence of these been proved beyond a doubt, by captains of merchantmen, and particularly by Capt. William Liddle, then commanding the ship General Mathew. The station which Mr. Paiba was to have filled in the Colonial Government of Bulama, a member of the council, gave me just reason to expect candour, a cultivated understanding, and correct observation; I therefore eagerly availed myself of the favourable opportunity of obtaining the information I so much

required ; and requested a friend, the Hon. Mr. Samuel Mitchell, then a member and since president of the council of Grenada, to introduce me to Mr. Paiba, in order that the suggestion proceeding from report and general information might be pursued by the communications that gentleman might be pleased to favour me with. Mr. Mitchell brought Mr. Paiba to my house, and was present during the greatest part of the time the conversation continued. I found Mr. Paiba very willing to give me every information in his power relative to the state of the Bulama colony, and of the ship Hankey ; but I found him strongly disinclined to fall in with the universally received opinion, that that ship introduced the disease. The particulars I have given are those Mr. Paiba related to me in this conversation ; and, in order to be correct, I, immediately after he left me, carefully committed them to paper. Mr. Paiba promised to favour me with a written account ; and, in order to direct that gentleman's attention to the points I considered as of most importance, I drew up a set of queries, and Mr. Mitchell obligingly charged himself with the delivery of it. But although I repeatedly, through Mr. Mitchell and Mr. Palmer, the gentleman with whom Mr. Paiba resided in the country, renewed my request to have
this

this promise fulfilled, Mr. Paiba left the island without gratifying it. If no other strong proof existed of something peculiar in the fever which at that time prevailed, the circumstance of my formally applying to Mr. Paiba for information relative to the state of the Hankey, and of taking the trouble to obtain an interview with him, presents an evidence as conclusive as can well be required by reasonable men. I am thus particular in relating facts of little importance in themselves, because the very same gentleman who readily entered into a conference with me in the year 1793, in which the circumstances I shall relate were freely communicated, gave a written narrative of the adventures of the Bulama colonists, to Dr. E. H. Smith of New York, in the year 1797, in which he labours to conceal such circumstances as tended to prove the existence of the semina of infection, and to palliate others which could not be obscured, by a specious representation. But, notwithstanding this artful proceeding, the comparison of both statements will fully exhibit the existence of causes sufficient to produce a concentration of malignant human effluvia, virulent enough to excite pestilential infection. The result will further disclose the inconsistency which arises from the opposition of truth and interest. As an agent of, as a

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person probably benefited by the Bulama Association, he imagined it became him to ascribe the truths which had been detected respecting the situation of the Hankey, to "an extravagant, unfounded, and malicious rumour," to "prejudices industriously raised against the colony at Bulama," "against an enterprize regarded with evil eyes by the West India planters; to whose opposition and intrigues," say these liberal minded agents of abolition and African colonization, "the shameful delay of justice in the British Parliament is chiefly to be attributed." The remarkable similarity in the prominent features of both narratives, removes all doubt respecting the material circumstances, and I therefore judge it proper to adhere to that which was communicated when the impression of them was recent and consequently strongest.*

The Hankey sailed from England, in company with another ship, both chartered by the Bulama Association,† loaded with stores and adventurers

* I beg leave to refer the reader to the glowing philippic of Dr. Elihu Hubbard Smith, of New York. *New Repository*, v. i. p. 471 to 491, and a *Vindication from Aspersions founded on the Narrative of the Member of the Council of Bulama*, v. ii. p. 285 to 291.

† The name of the other ship was the *Calypso*. In the first edition it is said, improperly, that these ships were chartered by the *Siera Leona Company*, a mistake I was led into by inadvertence.

for the projected colony at Bulama, about the beginning of the month of April, 1792. When these ships sailed, and during the voyage out, the crews and settlers were all healthy; and as the latter were in general of the middling class of people, and appeared to be induced to settle in this new country, more from the delusive prospect of wealth held out to them, and the fanatic* enthusiasm

* I have been censured in strong language by two zealous anti-abolitionists, for applying this expression to the unbounded philanthropic temper of the time—By one, Dr. Trotter, whose abilities and principles I highly respect, I am accused of ranging “on the side of a traffic in human beings.” (Med. Naut. p. 327)—The other, Dr. Smith, of New York, with a virulence which certainly no knowledge of my principles could justify, thus expressed himself: “With what temper Dr. Chisholm regarded this effort (the colonization of Bulama) of the friends of man; by how different principles he was influenced; or, at least, how ready he was to sacrifice truth at the shrine of prejudice and the wishes of his West India patrons, is evident from his own words; when, speaking of the motives which determined the colonists to embark for Bulama, he describes them as “induced by the delusive prospect of wealth held out to them (an indirect charge on the benevolent projectors), “and the fanatic enthusiasm for the abolition of the slave trade, &c.” He designedly forgets to add “of the moment.”—I mean not to enter the wide field of controversy on the question respecting the humanity, the justice, the policy, &c. of the slave trade: but the singularity of these writers falling so severely on me for the use of an expression, which, by no means, discovers a bias either way in the sentiments of its author, and which has passed the ordeal of criticism and public observation without the stigma of illiberality or inhumanity being attached to it, I cannot pass unnoticed. Although I trust I am possessed

enthusiasm for the Abolition of the Slave Trade of the moment, than by any deprivation of the means of subsistence in their own country, no
suspicion

of humanity to fully as great an extent as Dr. Trotter, Dr. Smith, or any man living; although impressed, at least, as strongly as any advocate for emancipation, abolition or regulation, with the necessity and justice of the late enquiries into the state of the slave trade; and approve as highly as any of them of the consequent measures taken to improve it; yet do I perceive no necessity for withdrawing the expression, "fanatic enthusiasm of the moment," when applied to several of those who appeared foremost in the contest. Who will be hardy enough to deny that humanity may be carried to excess; and in its researches after the amelioration of the state of the less civilized parts of mankind, may be often enveloped in those clouds of fancied philanthropy, which so constantly lie in its way; and thus prove a real source of evil, when good has been the object pursued. In such misapplications of benevolent principles, the impulse may well be denominated a fanatic enthusiasm. To no pursuit is the observation more applicable than that, the object of which is the improvement of the inhabitants of Africa. Blind to incontrovertible facts; distrustful of all in the smallest degree connected with the slave trade, our philanthropists see nothing but imaginary scenes of torture, studied barbarity, and "masters hell-bred," in the West India colonists. But I stand not alone in thus judging the conduct of many abolitionists. Attend to the wise suggestions of one of the most enlightened legislators of the American States, and unite in the wish, that an opinion so evidently founded on experience, may have the weight it is entitled to. Do we not confine lunatics, and keep knives and razors out of the hands of children? Why? Not because we are afraid of their intentions, but of their actions; because we are justly apprehensive of their doing mischief without intending it. Is there a description of people on earth who have inspired the world with a firmer confidence in their good intentions

suspicion whatever can be entertained of the existence of latent infection among them; nor can marsh effluvia be supposed as the origin of the

tions than the quakers? and yet we dread the consequences of some of their attempts. This society, so virtuous, so praiseworthy, and whose institutions are formed on principles so beneficial and benevolent, have, however, adopted it as part of their creed, have made it a tenet of their religion, that personal slavery ought to be abolished; and they go forward with unwearied perseverance to the accomplishment of this object without regard to risks or consequences. In vain do we tell them, that their attempts, if successful, must render the Southern States a new St. Domingo, a mournful scene of massacre, pillage, and conflagration, and must end in the common destruction of the blacks and whites, the slaves and their masters. In vain do we hold up to their view the recent and neighbouring example of the French islands, where similar maxims have reduced the most flourishing and beautiful provinces to one great slaughter-pen, have everywhere mingled the blood and the bones of the wretched inhabitants with the ashes of their dwellings. They answer they have no intention to produce the consequences, and do not apprehend them; that it is their duty to proceed, and that the consequences are with God. In fact, does not history teach us there is nothing more common than for men to do mischief, when they mean to do good? Did the La Fayettees, the Rochefoucaults, the Liancours, the Lameths, and the Clermonts of France, when they first taught the doctrines of insurrection, and stirred up the mob to resist the government, intend to pull down ruin on their country, their families, and themselves? Certainly they had no such intentions; and yet we find that these consequences did result from their measures; France and the world have groaned, and are groaning under these consequences; nor are they less real, or less deplorable, because their authors intended to do good, and not mischief. Fanatics never, or very rarely, intend to do mischief; and yet all experience

the disease which afterwards swept off so many of those unhappy people. Boulam or Bulama, being furrounded by the sea, enjoys all the advantages of the sea-breeze; and being dry, and not incommoded by any marshy tracts, it is considered as the healthiest spot on the windward coast. It is not inhabited, but occasionally vi-

experience proves that no description of men is half so mischievous. They rush blindly on, without reflection or hesitation, and aim directly at the accomplishment of their designs, without being delayed or turned aside by any considerations of the result. With these awful examples before us, shall we trust fanatic men with power, by reason of their upright motives; or sit regardless of the consequences of their actions, because we are convinced that their intentions are pure?" See Mr. Harper's Speech on the Foreign Intercourse Bill, delivered to the Committee of the whole House of Representatives of the United States, on the 2d March, 1798. I leave to the dispassionate reader to trace the applicability of these observations to the measures pursued by the enthusiasts for the abolition of the slave trade, and of personal slavery, and close this long note with the opinion of Horace—

Infani sapiens nomen ferat, æquus iniqui
Ultra quam satis est virtutem si petat ipsam.

Those who are in the habit of declaiming against the slave trade on the score of its inhumanity, may, if they are willing, be instructed by consulting the annals of Dahomy; and attentively considering the opinions of the Africans relative to the philanthropic measures. See the History of Dahomy, &c. by Archibald Dalzel. 4to. p. 216, &c. The unbiassed opinion of a very late traveller into the interior districts of Africa, should also be consulted; and if they are open to conviction, it will have its proper weight in regulating their judgment. See Travels into the Interior Districts of Africa, by Mungo Park. 4to. p. 239.

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sited by the natives of the adjoining continent, who have several scattered patches of millet on it. It is, however, destitute of fresh water; and that procured by digging temporary wells on the beach, is brackish, and consequently unwholesome. The negroes of this part of Africa are ferocious in an extraordinary degree; and are even said to be cannibals. This circumstance preventing the erection of any sort of accommodation on shore, during the nine months the *Hankey* lay there, the settlers were obliged to live on board; and the rainy season coming on almost immediately after their arrival, and the heat being at the same time excessively great, they endeavoured to shelter themselves from both, by raising the sides of the ship several feet, and covering her with a wooden roof.

Among upwards of two hundred people, of whom women and children constituted a part, thus confined in a sultry, moist atmosphere, cleanliness could not be well attended to, however well inclined the people themselves might be. These circumstances, joined to the depression of mind consequent upon their disappointment, must certainly be considered as the causes of the malignant fever which broke out among those unfortunate people, sometime after their arrival at Boulam. And no doubt can be entertained,
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that, neglecting to sweeten the ship, to ventilate her afterwards, and to destroy the clothes, bedding, &c. of those who died on board, was the sole and true cause of her retaining the seeds of infection when she arrived at Grenada. The following facts will serve to illustrate this: Capt. Coxe finding the water at Boulam, or Bulama, unwholesome, proceeded with his ship to Bissao, where there is a Portuguese settlement, for a supply. The ship was navigated by about twelve seamen, most of whom had not experienced sickness, and had been probably procured from Sierra Leone: at any rate they were then taken on board for the first time. Of these, before the return of the Hankey to Bulama, nine died; and the remainder, with the Captain, were reduced to a deplorable state. The time for which the Hankey was chartered being expired, Mr. Paiba, with his family, intended to return to England in her; but as no seamen could be procured, they were obliged to proceed to sea, having on board the captain sick, and only the mate, Mr. Paiba, and two seamen, to navigate the ship. With much difficulty they arrived at St. Jago, where they fortunately met the Charon and Scorpion ships of war. Capt. Dodd of the former, humanely rendered them every service in his power; and on leaving them, put two men of each ship

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on board the Hankey. With this aid they proceeded to the West Indies ; a voyage to England being impracticable in their wretched state. On the third day after leaving St. Jago, the men they procured from the ships of war were seized with the fever, which had carried off three-fourths of those on board the Hankey at Bulama ; and having no assistance, two of the four died : the remaining two were put on shore at Grenada and St. Vincent, in the most wretched state possible. The Hankey arrived at the Port of St. George on the 19th of February, in the most distressed situation ; and for a few days lay in the bay, but was afterwards brought into the Carenage.

Such were the leading points of the narrative Mr. Paiba favoured me with at Grenada, in the year 1793 ; and such were those he generally communicated to other gentlemen whose curiosity had been excited by the melancholy events which succeeded the arrival of the Hankey. Similar to these was the statement given by Capt. Coxe, before the Lieutenant Governor, Mr. Home, and several members of the council ; and this coincidence establishes the authenticity of Mr. Paiba's narrative. Violent attempts, however, have been made by Mr. Paiba, through the medium of the pen of the late Dr. Elihu Hubbard Smith, of New York, to invalidate the authenticity

city of it, and chiefly by publishing another from the same gentleman; yet a cursory attention to this, will demonstrate that the tortuous representation serves only to reflect discredit on its author; and that the tenor of both is essentially the same. One instance will be sufficient to show the truth of this assertion. "The hurry with which the colonists had quitted England," says Dr. Smith, "some delays created by the government at home, in their departure, and their number, which exceeded what was at first expected, prevented their carrying out with them many conveniencies essential to the commencement of an establishment like the one proposed, and retarded their arrival till near the beginning of the rainy season. Some of the Calypso's people had already fallen sick when the Hankey arrived; and as there were no accommodations provided on shore, both sick and well were confined to the ships. The rains now setting in, obliged them to frame a sort of covering to protect them from the weather. In this confined situation, the heat and moisture were very uncomfortable; a due degree of cleanliness could not be preserved; and the disappointment and chagrin of most, with unusual labour, soon introduced sickness."*

In two material circumstances the account I

* Medical Repository, vol. i. p. 474.

have here given differs from the narrative published by Dr. Smith. These are, the preservation of the clothes and bedding of the victims to disease on board the Hankey, and the precise period at which that ship arrived at Grenada. With respect to the first, it is said by Dr. Smith, on the authority of Mr. Paiba, I suppose, that "before the Hankey put to sea from Bulama, all the bedding of the sick was thrown overboard or destroyed; the ship was washed from stem to stern, both above and below, with salt-water, and then with vinegar and water; and the purification was completed by thoroughly fumigating her with tar, pitch, and gun-powder." Again, "at Bissao they refitted; and the Hankey was a second time purified as completely as she had been before leaving Bulama." Nay, unsatisfied with this reiteration of cleansing, we are told, that at St. Jago, "the purifications of Bulama and Bissao had been repeated."* But what does this ridiculous display of a cautious adoption of preventive measures; what do the assertions to the same effect, and the clamorous invectives of the trustees of Bulama association, amount to, when opposed to the evidence of many respectable eye-witnesses, who could have had no interest in baffling the views of that humane association, and

* Medical Repository, vol. i. p. 477, 478, and 480.

to the testimony of Captain Coxe himself? In addition to what I have already offered on the subject, I might produce a long list of respectable names, the credibility of each of whom is, at least, equivalent to the highest degree of faith the most strenuous friends of Mr. Paiba may be inclined to attach to his character. Such, however, would be unnecessary. The testimony of Captain Coxe was given before the Lieutenant Governor, Mr. Home, and several members of the council of Grenada. Mr. Home, sometime after the disease became epidemic, informed me, that in consequence of the information he had received from Captain William Liddle, and other gentlemen connected with the shipping, of the clothes, &c. of the victims of the fever at Bula-ma, being still on board the Hankey, he ordered Captain Coxe to be brought before him in council. Captain Coxe then acknowledged that all the effects of those who died, were then on board his ship, and said, that he would not destroy them, unless he was indemnified for the loss he might sustain, should the heirs of the deceased call on him for those effects. Every argument was used to induce him to destroy the articles in question, but the only one which influences a man of this description, indemnification. Yet these are the illiberal observations on this shameful

ful neglect, this mercenary spirit, productive of the most tremendous calamities, of the trustees of the Bulama association : “ so flaming was the zeal of the Grenadians against the abolition of the slave trade, and the *free* Colony of Bulama, that they employed every illiberal art to prevent Captain Coxe from getting a cargo at Grenada. But their malice did not end here : they sent home representations, or rather misrepresentations, respecting his ship, which were so strenuously supported by the West Indians, that government thought it proper to put the Hankey under quarantine, &c. The calumniators, however, had in view another object than truth ; and their success was such as might gratify the most malignant spirits ; for they had nearly caused the death of a man *who had never offended them*, and materially hurt the property of the ship’s owners, and, what must have been still more pleasing to *them*, greatly injured the Bulama association.”* A necessary precaution is thus distorted into a malicious motive. Mr. Home, with the advice of his council, and from the impression the idea of the danger which Captain Coxe’s conduct might be productive of on the arrival of the ship

* See “ Report of the Trustees of the Bulama Association to a Meeting of the Subscribers,” as quoted by Dr. Smith, Med. Repository, vol. i. p. 439.

in England, made on his mind, wrote to the Secretary of State, representing the danger ; and government took proper notice of this representation. But much of the danger which the importation of the feminia of infection might have produced, was prevented, by the destruction of the contaminated clothes, and bedding, at Grenville Bay, in Grenada. The late Mr. Edmund Proudfoot having chartered the Hankey to England, insisted on these articles being thrown overboard as a previous and indispensable condition. All the evils which had already taken place at St. George's, consequential upon the introduction of infection, were, however, renewed at Grenville Bay, before this step was taken. All the ships in that harbour, and all the inhabitants of the town and neighbourhood, suffered as much, in proportion to their number, as those of St. George's. The respectable testimony of Dr. John Stewart, an eminent practitioner in that district of Grenada, unquestionably establishes the fact.

The absurdity and falschood of Dr. Smith's statement of the period at which the Hankey arrived at Grenada, are exhibited by the Grenada Gazette of the 19th February, 1793, and by the entry in the books of the custom-house of the Port of St. George of her arrival. Dr. Smith, on the authority of Mr. Paiba, says the Hankey " arrived

rived late in the month, or not till the 19th of March; a month after the time fixed on by Dr. Chisholm." This circumstance, intrinsically of no very material import, is rendered of essential consequence, by being made a disproving testimony of the importation of infection by the Hankey. Thus does Dr. Smith vainly attempt to reason us out of the manifestation of our senses. "If the situation of the Carenage, and the weather of the year 1793, appear to countenance a different opinion than that of Dr. Chisholm, as to the origin of the pestilential fever of Grenada, a no less formidable argument may be deduced from his own representations concerning the time of its first appearance in that year. For in p. 91 the Doctor remarks, that "in the short space of time from the beginning of March to the end of May, 200 of about 500 sailors, who manned the ships in the regular trade, died of this fever." By this it appears that the fever in question broke out as early as the beginning of March. The dissingenuousness of this author, continues the polite remarker, is particularly evident from this quotation, if the period of the commencement of the disease be correctly assigned; and that it is so, is probable from the difficulty of concealing the fact; as there must have been thousands of witnesses to the progress

of the fever. *When, therefore, it was thought proper to fix the odium of introducing the disease upon the Hankey (a project of which Dr. Chisholm seems originally to have had no idea), it became necessary for him to assign an earlier date to her arrival.* Now that the Hankey did actually not arrive till towards the latter end of March, is verified by the concurring testimony of Mr. and Mrs. Paiba, and of Mr. Bell of this city, who happened to be in Grenada about that time, and was personally acquainted with Mr. and Mrs. Paiba in that island. So that, if the disease commenced as early as the first of March, Dr. Chisholm has inadvertently disproved his whole account of its origin; and it is clear that the Hankey (which did not arrive till after the 19th of March, instead of February) could not have introduced it.”* How easily is the baseless fabric overturned?

The following Extract from the St. George's Gazette, of the 19th February, will incontestibly prove this. “By the ship Hankey, of London, arrived here *yesterday* from the island of Bulam, on the coast of Africa, we are informed that she and another vessel carried out to that settlement upwards of three hundred adventurers, of whom *one-third* had not survived her departure from that settlement; indeed, the mortality raging

* Med. Rep. vol. i. p. 485.

there is so destructive to European constitutions, that the ship's company, the short time she lay there, were actually reduced to less than a third of her full complement of men.

“ Since framing the above, we have it from good authority, that of the whole number the two ships carried out, only *ten* were living when she took her departure.”

On this extract only one short comment may be made. From whom could the Editors of the Gazette obtain their information, but from persons on board the Hankey ; and would they presume to insert the information this passage contains, unless they had proper authority for so doing ? The answer is clearly, No.

But a proof still more cogent, and subject to no possible objection, is drawn from the custom-house books of the Port of St. George. I requested Mr. Melvill, at that time acting Collector of the Port of St. George, to favour me with the necessary information, and he obligingly did so in the following manner :

St. Pierre's, 9th Nov. 1798.

DEAR SIR,

AGREEABLY to my promise I send you a memorandum of the time the ship Hankey arrived at Grenada from Bulam.

The ship Hankey, Captain Coxo, entered at the Port of St. George, Grenada, the twentieth of February, 1793, from Bulam in Africa, as appears by the custom-house books of that port.

I remain, Dear Sir,

Yours, very truly,

CHARLES MELVILL.

Doctor Chisholm,

Fort Royal.

It has been suggested that marshy exhalations might have been productive of all the mischief attributed to want of cleanliness, imperfect ventilation, and concentrated animal effluvia; but, besides the probability that no infection could be generated from such a source, we have undoubted proofs that nothing marshy exists on Bulam or Bulama. This part of Africa is indeed allowed, by all who have visited it, to be uncommonly healthy and pleasant. I have conversed with several intelligent captains of slave ships, who have uniformly agreed in this point: and indeed the appearance of the slaves brought from the windward coast, part of which this is, constitutes a convincing proof of the salubrity of the climate. Many travellers have given their testimony to this effect: the Chevalier de Marchais, in particular, is very full of its praise. “ Le lit de cette
riviere

riviere (Sierra Leone) renferme quantité d'îles d'un terrain parfaitement bon, gras et profond qui produit de lui-même et presque sans culture tout ce-qui est nécessaire à la vie. Mais ce qu'on ne sçauroit estimer assez, c'est que l'air y est très pur, et qu'on n'y est point sujet a ces maladies violentes et dangereuses qui regnent à la coté de Guinée et qui ont fait perir tant d'Européens,"* Dr. Lind also speaks favourably of those islands, and the adjoining continent.†^x Mr. Paiba's account of Bulama, even with an allowance for the amplification of a zealot of a party, is strikingly correspondent—"The Island of Bulama, says this gentleman, in the narrative published by Dr. Smith, lies at the bottom of a deep bay, about fifty miles from the open sea, and opposite to where Rio Grand, a principal river of Africa, empties itself. The center of the island is computed to be in 11° north latitude, and 15° west longitude from London: the place where the settlement was ultimately fixed, is about 11½° north latitude. The circumference of Bulama is estimated at 120 miles, extending from east to west. The land rises gradually from the shore to

* Voyage du Chev. Des Marchais en Guinée et îles voisines, par le R. P. Labat, tom. i. p. 58.

† Diseases of Hot Climates, p. 56.

x. The positive evidence of its being a healthy island cannot be controverted by any reasoning; but, on the other hand, the non-existence of marches, by no means proves that a place may not be subject to fevers arising from Miasmata; for very rich soil (such as this is said to be) as containing a quantity of decaying matter, &c.

the middle of the island, which is well wooded, *abundant in fine springs of water*, full of game and wild animals of various kinds, and of a very fertile soil ; being totally, as far as yet investigated, exempt from marshes and stagnant waters, and from stony ground. The tide is regular, and the spring-tides rise about 16 feet. The range of the thermometer, by daily observations, at noon, for ten months, is from 74° to 96° of Farenheit; and the medium heat 85°. The rains commence late in May, or early in June, and continue till some time in October or November. On the whole, the situation is one of the most pleasant and healthy on the coast of Africa ; though, like other tropical countries, not perfectly adapted to the constitution of natives of northern latitudes, &c.”*

SECTION II.

The Progress of the Fever.

FROM the period at which the Hankey arrived at Grenada, viz. the 18th of February, 1793, are we then to date the commencement of a disease seldom before known in the West Indies, and certainly unequalled in its destructive nature.

* Med. Rep. vol. i. p. 473.

Nova pestis adest : cui nec virtute resisti,
 Nec telis, armisve potest—— OVID. *

The manner in which this disease was first communicated, and its subsequent progress, too clearly evinced its malignant and pestilential nature. A Captain Remington, an intimate acquaintance of Captain Coxe's, was the first person who visited the Hankey, after her arrival in St. George's Bay. This person went on board of her in the evening after she anchored, and remained three days; at the end of which time he left St. George's, and proceeded in a drogher, or coasting vessel, to Grenville Bay, where his ship, the Adventure, lay. He was seized with the malignant pestilential fever on the passage; and the violence of the symptoms increased so rapidly, as, on the third day to put an end to his existence.* This was, I believe, the first instance of the action of the infection; but Mr. Smith, quoting from a manuscript communicated to him by Mr. Paiba, endeavours, with his usual solicitude, to support the cause of those who maintain the endemic origin of the malignant pestilential fever, to invalidate the fact, by dating the visit of Captain Remington a month later, and

* The infection of the plague of Marseilles of 1720, was introduced in a manner precisely the same. Ruffel's Treatise. 4to. Ed. p. 211.

by attributing his death to his own imprudence. That this person had fatigued himself, and had even slept in wet clothes, might have happened ; but does this prove any thing further than a greater pre-disposition of his body to be acted on by infection ? But the statement of Mr. Paiba was evidently made after he had seen my essay ; consequently the purposes which it was intended to serve, are not effected : my evidence for what I have advanced is founded on the information of captains of vessels, who knew all the circumstances of Captain Remington's visit to the Hankey ; and of Dr. John Stewart, an eminent practitioner, who attended him at Grenville, when he arrived there. Dr. Smith has, however, on this sterile ground, exhibited an instance of the violence and illiberality to which a stickler to a party may be carried. " A mis-statement of this fact, he had the presumption to remark, *so surprizingly gross and enormous as that of Dr. Chisholm, unavoidably inspires something more than doubt concerning his whole narration.*"*

The crew of the *Defiance*, of Blythe Port, near Newcastle, were the next who suffered by visiting this ship : the mate, boatswain, and four sailors, went on board the day after her arrival ;

* Med. Rep. v. i. p. 433.

the mate remained either on deck or in the cabin, but the rest went below, and staid all night there. All of them were immediately seized with the fever, and died in three days. The mate was also taken ill, but, probably from his having been less exposed to the virulence of the infection, he recovered. The crew of the ship *Baillies*, from the same imprudent civility, or curiosity, were the next who suffered. These communicated the infection to the ships nearest them; and it gradually spread from those nearest the mouth of the Carenage, where the *Hankey* for some time lay, to those at the bottom of it; not one escaping, in succession, whatever means the captains took to prevent it; even the smell and smoke of coal, tar, which is uncommonly pungent and penetrating, had no effect as a preventive; for the *Hope of London*, then carcening, and having her bottom paid with this bitumen, received the infection as extensively as the others, although none of her crew died of it. These circumstances sufficiently confute the idea Dr. Smith of New York had formed of the cause of this fever. Had it proceeded from exhalations from the Lagoon, or the mangroves around that piece of water, the disease of course must have originated among the ships in the inner part of the harbour, and its progress would have been outward

outward towards the mouth of the Carenage, and not inward towards the bottom of the harbour. But the consideration of the cause I shall reserve for another part of this work.

In the short space of time, from the beginning of March to the end of May, 200 of about 500 sailors, who manned the ships in the regular trade, died of this fever. If to these we add, those who suffered on board Guinea-ships, and other transient vessels, the number cannot fall short of 250: which is nearly one in three, or a third of all the sailors during about ten weeks in harbour. From the beginning of June till the middle of August, when the disease had nearly disappeared, the number of sailors was considerably diminished, by two fleets having sailed for Europe; but the mortality was, notwithstanding, proportionably great. Although so great a mortality naturally leads us to form a dreadful idea of the virulence of the contagion which gave rise to it, it must not remain unconsidered, that the pre-disposition of the class of men among whom it happened, was very great. The sailors were men from the age of fifteen to fifty; and the circumstances which appeared to pre-dispose them more strongly than other men to the action of contagion, were violent exercise in the sun; the immoderate use of undiluted new rum; bathing in
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a state of intoxication, and often when violently heated; and the sleeping on deck during the night. Other circumstances which did not depend so much on their own prudence, no doubt, contributed very much to give the disease so very fatal a tendency: the damp heats between decks; the excessive filth of most of the ships; and the uncleanly state of the persons and clothes of the men themselves. Such were the circumstances to which I conceived myself justifiable in attributing the superior malignity of the disease among sailors. But on this enumeration of pre-disposing causes, Dr. Smith, with cavilling exultation, thus exclaims, “ what *madness* or *malignity* must possess a man to seek elsewhere for causes sufficient, in connection with climate, season, and the local situation of the people, to breed the most terrible of plagues?” He, however, intentionally forgot that the same degree of pre-disposition always prevails during the residence of sailors in a hot climate, and that therefore it is only when extraordinary morbid causes exist, such as the present, any epidemic sickness takes place. Every year during the summer months a considerable number of ships are detained in harbour in expectation of being laden, and their crews are fully as numerous, and fully as imprudent, as they were at the period in question; but

but nothing like an epidemic did I ever experience before—generally, sporadic fevers, sometimes of the ardent or yellow remittent kind, dysenteries, and pleuritic affections have been the consequences.

About the middle of April the disease began to appear on shore. The first house it shewed itself in, was that of Messrs. Stowe, Wood, and Co. gentlemen belonging to the Island of Bermudas, situated close to the wharf; and the infection was evidently introduced by a negrowench, who took in sailors clothes to wash. This family had enjoyed almost uninterrupted health before this period. If, therefore, their present sickness, which extended to every individual of the family, a few negroes excepted, had been owing to marsh effluvia, why did not the same cause produce a similar effect before, when the circumstances of heat, situation, mode of living, and temperament, were the same, and consequently equally capable of pre-disposing their persons to be acted on by it; and why were they all seized at nearly the same time? But it is necessary to observe here, that the part of the Carenage, where the disease thus first appeared, is reckoned by all the inhabitants the most healthy quarter of the town; the bay the least; so; Montserrat, or the division of the town bordering the inner Carenage,

Carenage, holding a middle rank in the scale of health. Now Dr. Smith totally mis-stating my observation, thus paraphrases it. "From the sailors and people of the shipping lying in the Carenage, the fever spread itself among the residents on the immediate verge of this inlet: among human beings *enveloped in impure air, buried in filth, and devoted to prostitution and drunkenness*; amid *wretched habitations, huddled together, exposed to the noxious exhalations and noisome effluvia of the Carenage*, directed more particularly upon them by easterly winds; and nearly sheltered from the purer breezes of the open sea, by a hill whose steep ascent conducts into the principal and best built part of the town;" but the least healthy. I am to conclude, from his own information, that he derived his knowledge of the situation of St. George's from Mr. Paiba, and a gentleman of New York; but the truth is, he was willing to believe where misrepresentation seemed to support his opinion. The inhabitants of the district of Montserrat are almost all free people of colour, and among them the disease *never* appeared affecting their own persons: many of the sick from the shipping were accommodated in their houses; but a peculiarity of temperament saved them generally, almost universally, from infection. The inhabitants of
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the bay, "the principal and best built part of the town," were more subject to it, than those of any other quarter: and many instances, which I could detail, occurred of gentlemen residing on the Hill, (another and still more healthy district of St. George's) receiving, most evidently, the infection from others labouring under the disease, who had no connexion whatever with the shipping, or any thing commercial.

A difference of temperature, and a free circulation of air; the temperament of the inhabitants, in general, less disposing them to be acted on by the contagion; the superior care and attention to cleanliness, rendered the fever infinitely milder when it appeared among the inhabitants. The manner, however, in which it spread in town, clearly evinced its contagious nature: for all who, from friendship, business, or duty, communicated with the diseased, were themselves infected: and no instance occurred wherein the contagion could not be traced to its particular source. Thus the observation of Lucretius was literally verified:

Qui fuerant autem præsto contagibus ibant.

A few, who more sedulously avoided the houses where the infected actually were, escaped; but all the means which come under the general designation

signation of prophylactics, were, as may be readily conceived, totally inefficacious. Of these, the celebrated "*Vinaigre de quatre Voleurs*," or the *Acetum Aromaticum* of the *Ed. Ph.* was generally used, and always without success. Camphor, sewed into a small linen bag, and hung round the neck, was another of this tribe; but equally ineffectual. It will not appear extraordinary, that the lower classes of men, and those more especially of loose and debauched manners, should be the most subject to this disease; their greater exposition to the influence of infection, which their business as tradesmen rendered necessary, contributed also not a little. But the description of men by far the most obnoxious to this contagion, and who suffered most from it, were those lately arrived from Europe; and of them those who had never been before in a hot climate. In general, those possessed of tense fibres, and sanguineous temperament, were the most readily infected, and among these the disease was most fatal. It is impossible to ascertain with precision the number of the infected among the inhabitants, and the proportion of the deaths to that, or to the general number of white males and females in *St. George's*; but where certainty is not, conjecture on good grounds may be admitted. We may therefore say, that the propor-

tion which the deaths bore to the sick, might have been about one to five; and the sick to the total number of white inhabitants, about one, to one and a half nearly. Before I dismiss this part of my subject, I may take leave to offer an observation on a remark of Dr. Smith's: he has said that infection could not have been introduced by the Hankey, because Mr. Paiba went several times on board that ship, mixed unrestrainedly with the town's people, was at Dr. Chisholm's house, at the houses of most of the respectable merchants in St. George's, and, yet, neither himself, his family, the friends with whom he resided, nor the families with whom he principally associated, ever had the disease; a fact very extraordinary, adds he, were Dr. Chisholm's notions of the virulence and extreme activity of the contagion, supposed to be introduced by the Hankey, well founded.* I have much reason to believe that Mr. Paiba's intercourse with the inhabitants was very limited; but exclusive of this, that this objection is possessed of no weight, is evident from the opinion of Dr. Russel, viz. that the healthiness of the ship's company is no indication of the state of her cargo, with which most probably they have had no interference.† This was precisely

* Med. Rep. v. i. p. 481.

† Treatise on the Plague, p. 350.

the case in the present instance ; for what connexion had Mr. Paiba and his family with the packages of clothes and bedding from which emanated the infectious aura, productive of almost unexampled mischief ; *their* clothes had not been contaminated with morbid fluids ; *their* persons had not been the subjects of disease ; nor probably had *their* cabins been in the occupation of the unfortunate sufferers. For an answer to his further cavilling remarks, and animadversions on a narrative so unambiguous, and a detail of facts so well known to every inhabitant of St. George's, I shall request the reader to peruse the judicious observations of Dr. Currie on the contagious fever at Liverpool, and the no less useful experience of Dr. Ruffel in the plague.

That part of the garrison quartered nearest to where the Hankey lay, were the first of this class of men who received the infection. A barrack, containing nearly one-half of the 45th regiment, was situated exactly to leeward of the Hankey, and distant from her about two hundred yards. It is not to be supposed, that this circumstance alone could be productive of a disease arising from contagion ; but it certainly was so in a secondary manner, by exciting the curiosity of some of the officers. One of these visited the Hankey, and with two or three soldiers who rowed his boat,

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remained

remained on board some time. The consequence of this imprudence was fatal to himself almost immediately after; and in a little time to many of the men: all the officers and men were successively seized with the disease; but it proved fatal only to recruits who had lately joined. The strength of the regiment at this time was 280, and of these 24 died; so that the proportion was one to something less than twelve. The smallness of this proportion arose, in a great measure, from the mode of treatment; as will be shewn hereafter.

About the beginning of May, the disease made its appearance in the detachment of the Royal Artillery: a circumstance rather extraordinary, as that corps were quartered in a situation far removed from the focus of infection. It was evidently produced, however, by the communication which the gunners, doing duty in Fort George, had with the 45th regiment; and the pre-disposition of the men to receive and be acted on by infection, as far as that could be induced by excesses in drinking, and other irregularities, was by no means less than that of the sailors and soldiers of the 45th regiment. Of 84 people belonging to the ordnance department at that time, about 56 were seized with the disease before the 1st of July, and of these five died: a trifling mortality, considering

considering the nature of the complaint. All these men, however, had been about three years in the country, and consequently suffered less from the disease, than about 27 recruits who joined the artillery in July. Of 26 of these unfortunate men who were infected, 21 died before the middle of August; a dreadful instance of its peculiar tendency to prove fatal to strangers to the climate. Ignorant of local circumstances, and presuming on a statement of the situation of the artillery barracks, I had occasion to make in an account of a fatal endemic fever published in the *Edinburgh Medical Commentaries* for 1793, Dr. Smith, eager to subvert every evidence of infection, however obvious, says the artillery station "was directly upon, or by the side of this offensive marsh at the head of the Carenage."* The fact is, Mount Cardigan, on which they had been stationed for nearly two years prior to the period in question, is about 900 feet perpendicular height, and altogether out of the range of the

* *Med. Rep.* v. i. p. 487. In quoting from my paper in the *Med. Commentaries* on the fever which prevailed among the Artillery in 1791, Dr. Smith has allowed himself to be carried away by an unwarrantable eagerness to support the opinion of his party; for if he had paid the smallest attention to the fact, he would have found that the barracks had been changed before the total disappearance of that fever, in order to prevent any future mischief from the malignant effluvia of the situation.

effluvia exhaling from the marshes lying to the eastward of the town, and has been always reckoned one of the most healthy situations in the island.

About the first of June, the disease began to appear among the negroes of the estates in the neighbourhood of the town; and the alarm thus occasioned was in proportion to the interest of those concerned in the safety and welfare of the slaves; but our apprehensions were soon found groundless; for the disease did not spread much among them, nor was it marked with the fatality which attended it, when it appeared among the whites. In the course of a month its progress was so trifling, that only about one in four was seized with it; and the proportion of its mortality was still more trifling, viz. one to 83. It is more than probable, that had not this disease been superadded to the cacochymic complaint, called by the French of the West Indies, *mal d'Estomac*, in the two cases which terminated fatally, there would have been no mortality at all occasioned by it.

About the middle of June, the disease broke out in the 67th regiment, and among the artificers and labourers on Richmond Hill. The infection was communicated by some of the latter, who had visited their friends in town labouring
under

under it. All were successively seized with it ; but it fell heavier on the officers than the men, several of the former being young men lately arrived from Europe. The proportion of deaths was about one to fifteen. A proof was furnished here of the efficacy which purity and salubrity of air, a free ventilation, and a windward exposure have in rendering infection mild ; for of about 300 men, at that time, the strength of the 67th regiment, only about 60 were seized with symptoms of infection, and of that number only three died, which is a proportion of only one to twenty. A proof was also afforded of the wonderful tendency of the disease to terminate fatally in those just arrived from Europe, however pure and open the air may be, and although cooler by several degrees than that breathed in St. George's.

The disease in the course of the months of May, June, and July, appeared in several distinct and distant parts of the country, whither the infection was carried by persons who had imprudently visited infected houses in town.

But the infection was not confined to Grenada alone ; from this, as a focus, it spread to the other islands ; and I have much reason to believe, to Jamaica, St. Domingo and Philadelphia, by means of vessels on board of which the infection was retained by the clothes, more especially the wool-

len jackets of the deceased sailors. Although this has been considered by some writers, unwilling to admit infection in any shape, or propagated in any manner, as a mere assertion unsupported by any well established facts, yet there is the probability of the thing itself, and the evidence of a multitude of eye-witnesses to prove the truth of it. I shall not enter here more largely into these proofs, but resume the subject in another part of the work, and in the appendix.

From about the middle of September till the month of February of the year 1794, the disease seemed to have disappeared every where in Grenada, and the inhabitants began to form, what they conceived, well grounded hopes, of the pestilence having, as is usual with epidemics, spent itself. But it is highly probable, that, from the ignorance, the sloth, or the avarice of the low retailers of rum, a pernicious class of people, the seeds of infection had met a secure retreat in their booths and shades: the want of subjects to act on, might have suspended the operation of the contagion for a time, but the arrival of strangers, in the fleet from England, to whom it has been uniformly deleterious, gave life to its seeds, which had hitherto been concealed, not destroyed. It is reasonable to conclude, therefore, that the town of St. George's had not been at any time, since its
first

first introduction by the Hankey, free from infection. Be this as it may, it is certain that the re-appearance of the malignant pestilential fever, and the arrival of an American vessel from Martinico, where that disease then fatally prevailed, were concomitant, or sufficiently so to establish the opinion that the infection was once more imported, in the month of February, 1794. Some doubts respecting the authenticity of this fact have been started by the American physicians, because the particular circumstances of the vessel were not detailed. Since my return to the West Indies, I have made enquiry into these circumstances, and the result has been, that the vessel was a brigantine, called the * * * * * of London, and commanded by * * * * *; that she touched at St. Pierre's, Martinico, where, finding a malignant pestilential fever prevailing generally among his countrymen at that port, and no sale for his cargo, the Captain proceeded to Grenada, where he arrived early in the month of February; that whilst in the road of St. Pierre, he had considerable intercourse with vessels having the disease on board; that from them his people received the infection, and the disease breaking out at sea, many were in a most dangerous state when they reached Grenada; and that the sick having been placed under my charge,

charge, I had no doubt respecting the identity of the disease. I have also taken uncommon pains to verify the introduction of the infection of the Philadelphia fever into St. Pierre's; and although the name of the vessel which imported the infection could not be ascertained, a sufficient train of circumstances has been developed, I imagine, to establish the fact in the minds of unprejudiced men. The interesting information obtained from M. D'Arcette I have inserted in the fourth part of this work. When I sailed from Grenada for England in June 1794, the disease prevailed extensively and fatally. From that period, the frequent arrival of troops and adventurers from Europe and America; the accumulation of the inhabitants of the country in town during the rebellious commotions of 1795 and part of 1796; with a variety of other causes; combined to render the contagion more general and more fatal in its effects. But towards the close of 1796 the malignant pestilential fever disappeared altogether; and since that period the inhabitants of Grenada have enjoyed a degree of health which England itself cannot boast the uninterrupted continuance of.

CHAPTER II.

Description of Persons most Subject to the Disease.
—General History of the Weather of 1793.

IN the preceding Chapter I have been particular in stating the progress of the malignant pestilential fever, chiefly with a view to demonstrate, 1st. That it originally proceeded from imported infection : 2d, That it was uncommonly infectious : 3d, That it arose from human contagion, heightened by various causes to a pestilential degree of violence : and 4th, That, like the plague, it has been communicated, in every instance, either by actual contact with an infected person : or by breathing air charged with effluvia perspired or discharged from the lungs of an infected person, or by touching the clothes of, or sleeping in a place where an infected person had been. It may be useful, and it is certainly curious, to point out the descriptions of people who were most subject to, and suffered most by, the infection of this dreadful malady ; and to observe the gradation of its violence with respect to these. Neither age nor sex were exempted from

from its attack ; but some were more obnoxious to it than others ; and the colour had evidently much influence in determining its violence. The scale of its violence, or the gradation it observed with respect to the different classes of the inhabitants, appeared to be the following :

1. Sailors, more especially the robust and young ; those least accustomed to the climate ; and those most given to drinking new rum.

2. Soldiers, more especially recruits lately from Europe ; and the most intemperate.

3. White males in general lately arrived ; more especially young men from Europe.*

4. All other white males, more especially the lower classes ; and of them the most intemperate ; those debilitated by recent sickness.

5. White females, more especially those connected with the shipping ; and those lately from Europe.

6. People of colour, from Mustees to Cabres.

7. Negro-men, more especially sailors and porters.

* Rush has judiciously observed, “ It is because men are more pre-disposed, by their constitution and employments, to indirect debility than women, and that young and middle aged persons are more pre-disposed to this species of debility, than old people ; that more men than women, and more young than old, were affected by the disease.” *An Account of the Bilious Yellow Remittant Fever*, p. 31.

8. Negro-women, more especially house-wenches.

9. Children, more especially white and those of colour.

In the foregoing scale, it will be remarked how much the approach to black in the complexion of those exposed to the infection determined its degree of violence. But we are told by Dr. Rush, that at Philadelphia, the negro-race was not exempted from the disease; a circumstance which proves, that, although in a hot climate a peculiar idiosyncrasy may procure these people this freedom from pestilential infection, yet it does not operate in a degree at all proportional in a cold one. May not this arise from a diminished oxygenation in the latter, and from a super-oxygenation in the former instance?*

The

* From an Account of the Bilious Yellow Remittent Fever, p. 97.—It is extremely probable, from these circumstances respecting the resistance perceived in the constitutions of negroes, to the action of contagion, that there is something in their formation which renders effluvia of this nature, when applied to, or inhaled by them, inert, or nearly so; and does not this peculiarity account for the rare occurrence of any very fatal disease, or any malignant epidemic, in their own country. The sword, poison, and the tyranny of their uncivilized and barbarous rulers, are the sole causes, perhaps, of depopulation among them; for even in situations the most destructive to the constitution of an European, they live and enjoy health. The mortality which formerly too often occurred among negroes in the middle passage, is very justly attributed,

The trifling disposition of children to be acted on by the contagion will also be remarked with surprize. In all the West India islands, Antigua alone exhibited an exception. There I have been

attributed; by P. Labat, to two causes, viz. the ignorance of the surgeons, and the bad quality of the provisions. *Voyage du Chev. des Marchais*, tom. 2. p. 140. To these causes, may be added another, the destructive practice, which obtained before the late restrictive regulations, of crowding the slave-ships; and the health, and trifling mortality which have since happily taken place in almost every instance, constitutes convincing proofs of the truth of Labat's observation, and of the necessity which existed for the humane interposition of the legislature. "They had not, when stowed together, so much room as a man in his coffin, either in length or breadth: they drew their breath with laborious and anxious efforts, and many died of mere suffocation. The customary mortality of the voyage exceeded seventeen times the usual estimate of human life. A slave-ship, when full fraught with this cargo of wretchedness and abomination, exhibited at once the extremes of human depravity and human misery." *Belsham's Memoirs of the Reign of George III.* vol. iv. p. 197.—A picture, when softened into a true distribution of light and shade, not very unfairly drawn. But to return—may not the very strong pungent effluvium which is generated in their own bodies, be one cause, perhaps a principal one, of this resistance? And may not another be the small degree of incitability the negro race possess. Innumerable instances exist which prove, that the degree of this faculty lessens by an evident gradation from the white man to the negro. Striking instances of this, are, their sleeping in the hottest tropic sun without sustaining the smallest injury; their sleeping under the heaviest and most pernicious dew with the same impunity; their requiring a much larger proportion of evacuating medicines to move them than whites; their using immense quantities of the most acrid pepper, not only without injury, but with considerable advantage, &c.

assured,

assured, by Dr. Byam, children were, if possible, more liable to receive the contagion, and to suffer by it, than adults. Perhaps in that island, some peculiarities in its atmosphere may have caused this singular tendency; and the observation of Dr. Rush may serve to confirm this conjecture. "All ages were affected by this fever; but persons between fourteen and forty years of age were most subject to it. Many old people had it, but it was not so fatal to them as to robust persons in middle life. It affected children of all ages. I met with a violent case of the disorder, in a child of four months, and a moderate case of it, in a child of only ten weeks old. The latter had caught it from its mother."* He afterwards gives a remarkable fact in proof of this, viz. that of 75 who died of this disease, 24 were children. Thus, probably, the same causes which secure exemption to the negro-race, may have effected similar impunity to children.

The following Table will shew at one view the prevalence of the malignant pestilential fever; and the proportion of its mortality in the town, garrison, and neighbourhood of St. George, from March to about the middle of September, 1793, when it seemed to entirely disappear.

* Account of the Bilious Yellow Fever, p. 93, 94, 158.

Description of People.	Of the general Number Sick.		Of the Sick died.	
	One in about		One in about	
Sailors	-	1	-	3
45th Regiment	-	1	-	12
67th Regiment	-	1	-	15
Royal Artillery	-	$1\frac{2}{3}$	-	3
White Inhabitants	-	$1\frac{1}{2}$	-	5
People of Colour and Negroes*	-	4	-	83
General Proportion	-	$1\frac{1}{4}$	-	20

* This calculation of the proportion of sick and mortality among the Negroes, arises from the following detail. The following estates were those only on which the disease appeared: Point Maurice, or Molenier's, had a gang of 160; Grand-Mal, 179; Tempé, 147; Haut-Brion, 114; in all, 600. Of these 166 had the Malignant Pefilential Fever, consequently the proportion of sick was nearly as 1 to 4; and of deaths, as only two died on Tempé, as 1 to about 83.

It had been urged by some, in the year 1793, that the disease proceeded from the state of the atmosphere at the time; and that human contagion could not give rise to it, because it was prevalent in distant and distinct places at the same time. This opinion has been since warmly adopted, and supported with no common subtlety, by some of the American physicians. One of these, Dr. Smith, observes, that “from a comparative view of the weather, at Grenada, in different years, it appears, that whereas the seasons in general are singularly marked by long continuance of very wet, or very dry weather, in the year 1793, after the preparation of a dry spring, they were distinguished by alternate rains and dry weather; a succession the most favourable to prepare and bring into action the morbid miasmata of the neighbourhood of St. George: and to this, adds he, in conjunction with other causes, enumerated in the course of this Essay, may be ascribed the peculiar severity of the yellow or pestilential fever of 1793.”* That this opinion was without foundation, must evidently appear from the foregoing narrative. Its want of stability must also appear from the consideration of the usual course of diseases, of a nature strictly

* Med. Rep. vol. i. p. 84.

endemic, observed in the climate of the torrid zone. What endemic diseases prevail from January till June? Those of a highly and uncombined inflammatory diathesis, and chiefly local or glandular. What are those which mark the hotter months, and the period which in Europe is distinguished by the appellation, autumnal? They are such as proceed from what may be called a bilious diathesis, or such as arise from a morbid state of the intestinal canal. Is the malignant pestilential fever marked by either of these characters of disease? I think the answer is clearly—No. But had there been no other proofs of its contagious nature, the state of the weather alone, assumed as an argument against the position by a person ignorant of the climate, and the diseases incident to it, during the months of February, March, April, May, June, July and August, will be sufficient to shew that the temperature of the air could not produce an epidemic of so uncommon a character. The weather, though previous to the appearance of this disease much more wet and boisterous than is usual at that season of the year, was, after it broke out, mild; and would rather have tended to check than promote infection, if that had been of a nature to be affected by such an agent. The two first months of the year were almost constantly

stantly rainy. The latter part of March, all April, and the first fifteen days of May, were dry, with the wind generally at east. The thermometer never rose higher than 87, nor fell lower than 85. Almost all the remainder of May was rainy, with sometimes thunder and lightning. In June the quantity of rain was much greater. As the change to moisture was remarkably sudden and great, much expectation was formed that the virulence of the infection would be done away, or considerably abated; but as neither happened, the strongest possible argument was afforded against the agency of the weather in the production of the malignant pestilential fever. In June, the thermometer, more than once, fell to 77 at noon; and rose once as high as 88. All July was rainy also, with boisterous wind from N. E. and much thunder and lightning; thermometer highest 88, lowest 77. In August less rain fell; but the atmosphere was generally close and sultry; wind variable, but chiefly S. and W. Thermometer highest 89, lowest 80. In another part of this work I shall resume this subject, and exhibit such further arguments as may occur to me, to disprove the position of Dr. Smith, of New York, viz. that “the weather of 1793 was favourable to the *generation* and *spread* of pestilential diseases in the vicinity of the Carenage” of Grenada.

CHAPTER III.

*General History of the Malignant Pestilential Fever ;
with the Symptoms of that Disease particularly
described.*

THE subjects of the malignant pestilential fever may be divided into three classes; differing from each other only in the degree of violence of the symptoms; and from the scale of gradation already given, it will readily appear, that the three first descriptions of men constituted the first class: the 4th and 5th, the second; and the 6th, 7th, 8th, and 9th, the third. To avoid repetition, I shall first describe the disease as it appeared in those seized with it in its most violent and fatal form; and afterwards treat more particularly of its most remarkable symptoms.

The patient, without any previous complaint, suddenly becomes giddy; he loses his eye-sight; every thing seems to move round him with inconceivable velocity; he falls down almost insensible, and in that state remains half an hour or upwards. During this paroxysm the body feels
cold,

cold, and is overspread with cold sweat, which issues from every pore in astonishing abundance. On his recovery, the cold goes off, and is instantly succeeded by intense heat, and quick, small, hard pulse; the head aches dreadfully, particularly the forehead and sinciput, which is generally accompanied with pain in the right side, and at the præcordia. The last, however, has never been acute, and may be rather called oppression than pain. The eyes are much inflamed, watery, protruded, and widely rolling; the face much flushed; much heat is felt at the pit of the stomach; and that organ seems to be considerably affected by the nausea, frequent reaching and vomiting, which then come on. The patient soon after complains of intolerable pain in the small of his back, and in the calves of his legs; but the last appears to be the most violent. During twelve, eighteen, twenty-four, or thirty-six hours, these symptoms continue increasing, except the quickness and hardness of the pulse, which do not change materially during that time, and are then succeeded by general coldness, cold sweat, a greater or less degree of coma and delirium, or a state very much resembling intoxication. Life in this state is lengthened out to sixty or ninety hours from the first attack. A short interval of reason then takes place; the patient

considers himself better, and is for a moment flattered with the prospect of recovery; but a fit as sudden and unexpected as the first comes on, during which, he foams at the mouth, rolls his eyes dreadfully, and throws out and pulls back his extremities in violent and quick alternate succession. The patient in general expires in this fit; but some have recovered from it, and continued rational for a few hours longer, when a second fit has carried them off. This has been the general progress of the disease in its worst form; and indeed there have not been many deviations from it; the principal of these were, the general symptoms coming on, without any preceding convulsion. The patient has been comatose from the very commencement of the disease,* in some instances; others have had the disease ushered in by a frequent succession of short convulsive fits, and it has been afterwards marked with constant delirium and cold clammy sweat, &c. The disease too, in a few cases, has seized the patient in the manner most other fevers come on, that is, with shivering and a sense

* The same has been remarked in the plague. "The comatous disposition sometimes attended from the access, sometimes came on in the advance of the disease, and very often alternated with delirium." Russel, p. 83. Convulsion sometimes is a formidable symptom also in the plague. Ibid. p. 90.

of cold. The most constant symptoms, and consequently those which distinguished the disease, were the uncommon suddenness of the attack; the remarkably acute pain in the loins and calves of the legs, the watery, inflamed, and rolling eye; the flushing of the face; the tendency to coma from the very onset; the peculiarity of the delirium attending; and the pain confined to the forehead seldom extending to the temples, or even to the sinciput. However mild cases might be in other respects, these were always present. In no disease I have ever met with, is the physician more liable to be deceived; for often when every symptom, indicating danger, has been apparently removed; when the skin has become cool, the pulse seemingly natural, and the stomach so retentive as to receive a large quantity of bark, convulsions have suddenly seized the patient, and soon deprived him of life: or delirium and cold clammy sweats superseded the favourable appearances, and have forerun dissolution. How applicable, therefore, is Mr. Tissot's comparison of the malignant fever to a dog who bites without barking, to the insidious disease before us. " *L'on appelle fièvres malignes, celles dans lesquelles, le danger est plus grand, que les symptomes ne sont effrayants. Elles font du mal sans paroître dan-*

gereuses ; c'est, comme on l'a fort bien dit, un chien qui mord sans aboyer.*

The delirium attending the malignant pestilential fever is of a peculiar cast. During it, the countenance, the eyes, and the actions of the patient resemble very much those of a person inebriated ; and thus bears a near affinity to delirium in the plague.† It is almost always mild, and never furious ; but is accompanied constantly with restlessness, and efforts to get out of bed. In a few instances these rose so high, as to render the attempts of the assistants of no avail ; the patients dressed themselves, went out, and walked a considerable way before they could be overpowered. The mind seems agitated by the objects which were most its pursuit during health. An engineer, in his delirium, is continually employed in giving directions to the inferior officers,

* *Auvis au Peuple*, ch. 17. I may here remark that Dr. Ruffel's description of the five classes of the infected in the plague, agreeably to the greater or less violence of the symptoms, corresponds very exactly with the malignant pestilential fever, in general, except only the eruptions. The 1st, 2d, and 3d classes are the most similar to the worst cases of this fever, and therefore may be compared to the 1st class of it ; the 4th may be compared to my 2d ; and his 5th to my 3d. His 1st, 2d, and 3d, were always mortal ; his 4th was in mortality as 1 to 2 ; and his 5th always recovered. *Treatise on the Plague*, from p. 96 to 111.

† Ruffel, p. 82.

advising

advising with them, and superintending the labour of the workmen. A man involved in debt, is incessantly arranging with his creditors. A soldier talks of the duty he is employed in, and ever and anon expresses his fear of the officer's displeasure. A sailor, in the same manner, is solely engaged in maritime affairs. Scenes of former pleasure are eagerly recalled, and presented to the imagination in their most alluring circumstances; and if a momentary interval of reason takes place, the most piercing lamentations are the consequence. But in all cases of delirium, whatever the subject may be which the patient raves about, he is evidently, and strongly actuated by fear; and a word from the physician immediately reduces him to the most implicit obedience, however restless he might have been before. No pain is complained of during this state: the irritation of blisters has no effect in rousing the patient; and the operation of medicines that prove laxative, though not administered with that intention, passes without observation, and without sensibility. The patient, on being questioned respecting his situation, seems to recognize the person who speaks; but never complains of any thing: his answer being constantly that he is very well. Indeed, during the low state of the fever, whether delirium is present or not,

the

the sensations of the patient seem exceedingly imperfect; and, instead of referring to any symptom which the bystanders perceive evidently, his answer invariably is, that he is very well, and sensible of no pain. During delirium, the patient's lips are in continual motion; he is continually muttering, and he is continually attempting to reach to some object which his deranged imagination presents to him. The strength, during the delirious state, appears to be surprisingly great, for it is frequently necessary to use the united efforts of two or three men to keep the patient in bed. This, however, is no more than a spasmodic affection of the muscles; for, in reality, the powers of the sick in this disease are reduced to the extreme of debility, as is seen in the convalescent state. The delirium comes on generally at the commencement of the low state, but is frequently present during the whole of the disease. Dr. Rush observed this morbid strength also.

Coma is the next most remarkable symptom in his fever. After the first two days there is always more or less tendency to it; but, after the third day, if the patient survives it, it has been in almost every instance present. He appears drowsy, and is insensible of pain, or irritation of any kind; he moans and sighs much, but is immoveable

moveable unless called on. He generally lies on his back, with his eyes half open, the balls of which do not appear to be capable of motion : if there is any, it is extremely languid ; their lustre is also much diminished. For some time I could not account for the supervention of this state at a certain stage of the disease : anxious to discover whether it depended on any peculiar affection of the sensorium, I examined the brain of two men who died on the fifth day. These patients, after the symptoms strictly febrile had abated, became comatose ; in which state they continued till a convulsion put a period to their existence on the fifth day. In the first I examined, the upper part of the cranium, on being sawed and prized up by a chissel, was so pressed from inwards by the distension of the cerebrum as to fly off, or separate in such a manner as if a spring from within acted on it. On cutting into the cerebrum, the quantity of serous fluid was surprisngly great ; but as the greatest part was lost, it was impossible to ascertain it. In the brain of the second, the quantity of water was also considerable. After observing these appearances, I was led to examine more attentively the state of the eyes of my patients in this disease ; and I have not the smallest hesitation in declaring, that in all those who became comatose, there

there was a very considerable and permanent dilatation of the pupils : an appearance which left no room to doubt respecting the state of the brain, and the nature of the symptom it gave rise to. This singular appearance, I believe, had very generally escaped the notice of physicians in malignant and pestilential fevers, before the publication of Dr. Rush's Account of the Philadelphia Fever, and of my Essay on that of Grenada, of 1793 ; and if such observations as occur in a few writers may be considered as having a relation to it, they must also be considered as extremely indefinite and equivocal. Thus M. Poissonier Desperrieres says, " quelquefois la surdité survient, et quelquefois aussi une goutte sereine : " * thus also M. Dedier, in his account of the plague at Marseilles, as quoted by Dr. Ruffel, " les yeux sont enfoncées, s'appetissent, sortent de la tête, sont plus ouverts que de coutume, &c. " † Dr. Ruffel probably meant this symptom by the appellation, " muddy eyes. " " This change in the eyes, " he observes, " was extremely remarkable. It sometimes was visible from the first day, but more commonly from the second or third, and remained till some favourable change of the disease took place. It resembled somewhat the dull fixed

* Traité sur les Maladies des Gens de Mer, tom. i. p. 290.

† Traité de la Peste, p. 590.

eye, observable in the last stages of malignant fevers; but the dullness was different, *muddiness and lustre being strangely blended together.*" Perhaps Dr. Russel, as well as the other physicians who have attempted to give a description of this appearance, particularly those whose names are inserted in the note annexed to the passage I have quoted of the Doctor's Treatise, did not think it sufficiently prudent to be *too* minute and *too* close in their inspection; and hence the appearance recorded by them might have arisen from the causes to which I have attributed dilatation of the pupils, and might have been precisely the same affection of the eye, although thus indefinitely described.* Dr. Rush, in his observation and description of this remarkable symptom, is, as usual, precise and correct. "For a while I ascribed this peculiarity in the pulse (a small, intermitting, slow, and tense, or chorded pulse), more especially its slowness, to an affection of the brain only, and suspected that it was produced by what I have taken the liberty elsewhere to call the *phrenicula*, or inflammatory state of the internal dropy of the brain; and which I have remarked to be an occasional symptom and consequence of remitting fever. I was the more dis-

* Russel's Treatise on the Plague, p. 83, 85, 89, &c.

posed to adopt this opinion, from perceiving this slow and intermitting pulse more frequently in children than adults. Impressed with this idea, I requested Mr. Coxe, one of my pupils, to assist me in examining the state of the eye. For two days we discovered no change in it; but on the third day, after we began to inspect the eyes, we both perceived a preternatural dilatation of the pupils in different patients; and we seldom afterwards saw an eye in which it was absent".* Many medical practitioners of eminence in the West Indies have since assured me, that after their attention was directed to the state of the brain, they found this dilatation of the pupil so remarkable as almost to distinguish the fever.

The appearance which marked the character of the fever most unequivocally, was a species of efflorescence, which is said to be peculiar to malignant and pestilential fevers: this efflorescence, resembled more patches of red or livid spots, than what is generally understood by the word pe-

* An account of the bilious remitting yellow fever, p. 42, 49. The non-existence of water or serum in the cavities of the brain in the natural healthy state, seems to have been proved beyond a doubt, by the dissection of the head of a man beheaded at Brunswick, in the year 1797, thirty minutes after the execution. See Med. and Chirurg. Review for Sept. 1798, p. 198, Article 20th. "Examen fait sur l'Existence d'un Fluide Aqueux dans les cavités Cérébrales, &c."

techiaë; and appeared sometimes at the commencement of the low or comatose state; but oftener a few hours before death. It was a very fatal symptom; for I do not recollect a single instance of recovery when it took place. The neck, shoulders, and breast, were generally the parts of the body the eruption broke out on; but in a few very violent cases, almost the whole body has become of a deep livid or black colour three hours before death. In one instance, a young woman just arrived from England, petechiæ evidently appeared on her neck, breast, and arms; and it was the only one in which I perceived any thing of the kind; they constituted as fatal a sign as the vibices, for the patient died soon after their eruption, on the third day of the fever. It is worthy of remark that petechiæ were by no means common in the plague of Aleppo, but that the wales or vibices were, on the contrary, very frequent; and that the state of these eruptions, as it is described by Dr. Russel, as well as the nature of the prognostic to be drawn from them, resembled very much indeed what took place in the malignant pestilential fever.* These patches are well defined by Tissot, by comparing them to the wales or marks which

* Russel's Treatise on the Plague, p. 132, 137.

remain after a severe drubbing. “ La peau se couvre souvent de taches pétéchiâles (ce sont de petites taches d’un livide rouge), sur-tout au cou, autour des épaules, au dos ; d’autres fois ce sont de grandes taches brunes, telles que de meurtrissures de coups.”* Dr. Ruffel takes notice of two other species of eruption which he observed at Aleppo, and which seem to be peculiar to pestilential or infectious fevers: these not unfrequently appeared in the more violent cases of the malignant pestilential fever. “ Large blue or purple spots, the maculæ magnæ of authors, were sometimes observed with or without the vibices, a little while before the patient expired ;” the other was “ a certain marbled appearance of the skin, sometimes visible in different parts, in the height of the disease, or some hours before death.” The latter was particularly remarkable in the case of Lieutenant Watkins of the Royal Artillery.

The pains complained of in this fever, particularly those of the head and legs, are, in many respects, peculiar to it. The former is confined to the forehead, and shoots inwardly towards the bottom of the orbits, where it is generally exquisite ; it also sometimes extends to the temples,

* Avis au Peuple, p. 257.

where indeed there is always a throbbing. In no case has pain been felt in the occiput, or generally throughout the head. The albuginea of the eyes is always much inflamed at the same time ; the balls are generally protruded, or seem ready to start from their orbits ; and the patient is sensible of a pain in them, which renders the admission of light intolerable. It has sometimes happened that the right eye has been most considerably affected ; and when this has been the case, the pain has been most felt in the right side of the head. The pain in the legs has been uniformly felt immediately below the calf, where the gastrocnemii and soleus muscles unite and form the great tendon. A considerable involuntary contraction of the leg takes place in consequence of it ; and in the point where it is chiefly felt, it communicates a sensation similar to gnawing, which from time to time occasions extreme torture. Upon the whole, this pain resembles very much the cramp ; with this difference only, that it is, during the continuance of the fever, more permanent.

I have already observed, that at the commencement of this fever, the pulse is quick, hard, and small ; and it is always so in the more violent cases. It is often, however, very full at this period ; and when it is so, it affords a favour-

able prognostic. But in no disease is the state of the pulse more subject to variation than in this before us. It has frequently happened, and more especially with the robust, that, during the stage immediately succeeding the febrile one, flushing and chilliness have oftentimes alternated in less than a minute; and that, although the skin felt considerably warm, the pulse has been no more than 52; but, that, even when the low state came on, in which there is always a disagreeable coldness of the surface, it has been as quick and nearly as full as during the preceding febrile stage, although unaccompanied with thirst, or any other evident symptom of the existence of fever. One remarkable circumstance of the pulse in this disease is, that it never intermits; even at the approach of death it has not intermitted, but has been generally remarkably tremulous, and so slow, as to beat no more than 30 times in a minute. Upon the whole, I have never found it quicker than 130, nor slower than 30, in a minute. It is observable that in several cases the slightest pressure could produce a cessation of pulse; a circumstance also taken notice of in the plague by some of the French physicians; thus M. Chicoyneau says “ *Les faissions étoient suivis d’un pouls vif, ouvert, animé, que néanmoins se perdoit pour peu qu’on pressât l’artere;*”

also,

also, “ quelque soit l'état de pouls et ordre des pulsations le pouls se perd toujours quand on comprime l'artère.” Dr. Ruffel himself adds, from his own observation, that “ where the pulse was low, small, and quick, it sometimes seemed to disappear as it were upon pressure, but not so when high and full.”*

Subsultus tendinum is by no means a common symptom in the advanced stage; but tremor of the hands and of the lips, and violent spasmodic contraction of the legs and arms are very common, and always prognosticate much danger. Dr. Rush has made the same observation—“ I was surprised to observe the last stage of this fever to exhibit so few of the symptoms of the common typhus or nervous fever. Tremors of the limbs and twitchings of the tendons were uncommon.”† Similar to this is what happens in the plague. “ Convulsive motions in the limbs were frequently observed in the course of the disease. The subsultus tendinum appeared to me to be less frequent than in ordinary malignant fevers; but a continual trembling of the hands, without startings, was very common.”‡

* Treatise on the Plague, p. 86. Note 17.

† Account of the Bilious Remitting Yellow Fever, p. 62.

‡ Ruffel, p. 90.

The appearance of the tongue was very various; in some patients continuing white, with florid edges to the very last; in others, becoming dark coloured very early, and changing to black a little before death; but in general, the change of colour of the fur with which the tongue, teeth, and even the fauces are covered, is gradual. Thus, during the two first days it is white or clayey; it afterwards becomes buffy; then of a deep orange: about the fifth day, brownish; and when the case terminates in death, black. The thickness of the fur increases with the disease, and seems latterly to impede much the speech of the patient. The edges of the tongue are generally florid, exactly resembling its appearance in chronic aphthæ. I have not unfrequently seen the tongue have the appearance of having been exposed to soot, and covered with it: a singular circumstance, and mentioned by no writer I am acquainted with, except M. Tiffot. “*Quelquefois cependant elle ressemble exactement à une langue qui auroit été long-temps exposée à la fumée.*”* In this instance too does the resemblance of the malignant pestilential to the plague, hold. The tongue, says Dr. Ruffel, very often retained its natural appearance, but when

* *Avis au Peuple*, p. 1. ch. xviii.

it changed its colour, it in general became white and remained moist, &c.”*

Aphthæ sometimes occurred ; and, I think, were generally a bad symptom. Those I have seen were always of the white kind, resembling curd, and have been accompanied with a thick fur, of the same consistence and colour, on the teeth and gums. This symptom has been mentioned by Huxam and Poissonnier ; the former of whom says, “ but of much more uncertain and dangerous event are the brown dark-coloured aphthæ ; nor are those that are exceeding white, and thick like lard, of a more promising aspect.”

There were two kinds of eruption about the lips, of a very opposite nature : one such as frequently appears at the termination of common remittents, and indicating a favourable change ; the other, consisting of black spots or specks, such as might be made by the point of a painter’s fine pencil, all round the mouth, but especially the upper lip, and near the edge of the prolabium ; and indicating with certainty a fatal termination. The first generally appeared about the fifth day ; the latter about the beginning of the third, or towards the end of the fourth day.

Hæmorrhage has occurred in this disease much

* Ruffel, p. 86.

oftener and more profufely, and has been attended with more dangerous confequences than in any other, the fcurvy perhaps excepted, that I have met with. In feveral instances the immenſity of blood difcharged has evidently been the more immediate caufe of death. The robuſt, plethoric, and groſs habits, have been the moſt ſubject to it. It has taken place from the noſtrils, mouth, anus, and urethra ; ſometimes from the canthi of the eyes ; and in a few caſes, from the ears and pores of the ſkin. The moſt profuſe diſcharge has been from the noſtrils and anus, and has frequently amounted to three or four pounds at a time ; the ſtools having been, on theſe occaſions, entirely compoſed of pure blood. Towards the cloſe of life, the blood thus diſcharged has appeared granulous, or like ichor, with a ſediment of a black gritty ſubſtance, and has been ſo extremely offensive as to oblige all the attendants to keep at a conſiderable diſtance till the hæ-morrhage ceaſed. Hæ-morrhage, however, has never been critical, nor has it, in any inſtance, permanently relieved the headach or pain in the breaſt or ſide. I have ſometimes been induced to think, that it had benefited the patient, by his declaring that the headach had abated in conſequence of it ; but cold clammy ſweats, an almoſt imperceptible pulſe, and delirium or coma ſupervening

supervening soon after, evinced the imperfect state of the patient's feelings, and the fallacy of the prognostic. An observation precisely similar has been made by Dr. Ruffel in the plague. "Hæmorrhages, if not very slight, were, in general, reputed dangerous in whatever stage of the disease; and most of the cases wherein they occurred, especially if late, terminated fatally.*

Nearly about the period these profuse discharges of blood came on, a rawness was felt on the whole of the interior surface of the nose; and on several parts of it, little ulcers formed; on others, small scars, which were remarkably itchy; but on being touched, or an attempt made by the patient to detach them from the membrane of the nose, were very painful, and bled. These disappeared in proportion to the patient's recovery; and I had much reason to suspect that when the issue of the disease was fatal, these little scars became gangrenous.

About the same time another symptom appeared in many instances; which, were it not for its singularity, might be considered as too minute to be mentioned among those which distinguish the disease. Its singularity arises chiefly

* Treatise on the Plague, p. 94.

from the silence of modern writers on the malignant, hospital, or jail fever, with respect to it; and from its appearing to be critical in the present instance. About the end of the second day the patient begins to complain of a violent pain in his testicles; on questioning him, he says, he perceives a contraction of the spermatic chord, and is sensible of a drawing up of the testicles toward the abdominal ring. On examination, they appear very much lessened in size, are drawn up very considerably towards the abdomen, and the scrotum appears at the same time remarkably flaccid and empty. The surface of the scrotum becomes soon after very painful, and an excoriation takes place, chiefly at the most depending part, from which a considerable quantity of very offensive purulent matter issues: at the same time a similar discharge from the urethra takes place, which ceases with the disease when the event is favourable, or becomes ichory or bloody, and insufferably foetid when death is the consequence. In cases which terminate favourably, the whole of the scrotum in a few days is covered with a coat of hardened pus, which, in the convalescent state, comes away very easily by means of a warm bath. The thickness of this coat may be about the fourth of a line, and when separated, re-

sembles

seem much moistened parchment. In fatal cases, this affection of the scrotum always terminates in gangrene a few hours before death.*

The

* Dr. Donald Monro mentions the occurrence of a swelling and subsequent suppuration of the testicles in the malignant fever. Diseases of the Army, 1st Ed. p. 44. M. Poissonnier says only “ il se fait bientôt des écorchures dans certaines parties de leur corps, et la gangrene s'en empare malgré toutes les précautions qu'on lui oppose,” tom. i. p. 291. I think something of this kind is mentioned by Thucydides, in his celebrated account of the plague of Athens. In Dr. Clifton's translation of this part of Thucydides's history, there is the following passage: “ For the disease went through the whole body, beginning first in the head; and, if any escaped, where the case was very desperate, this was denoted by the *extremities* being affected; for it broke out upon the *private parts*, the fingers, and toes, &c.” Clifton's translation of Hippocrates upon air, water, and situation, &c. Ed. 1739, p. 97. In thus rendering the expression “ των γε ακρωτηριων αντιβηψις αητη επεσημεινε” of the original, Dr. Clifton has followed the example and authority of his predecessors; and the general formation of the passage, and the probable meaning of the author, seem to give stability to this explication; for the word ακρωτηριων, although it cannot be said to apply to the *private* or genital parts but in a very general and loose sense, yet figuratively it may; and, thus, were we to consider the scrotum and penis as comprehended under the appellation of extremities of the body, which ακρωτηριων properly signifies, then the propriety of its use here would be manifest. That this is the sense of Thucydides appears more clearly from Lucretius adopting it, and from the universal coincidence of the Commentators. This opinion appears still more proper, from the sentence immediately following, in which the gangrenous affections of the *hands* and *feet* are mentioned, “ κατεσκηπτε γχε και τραχεας χειρας και ποδας.” The opinion of a writer who has combined the most profound and extensive erudition, with elegant and correct

The change of voice is very remarkable in this fever; for from a strong tenor, or manly sound, it sinks to a treble, or a sound much softer, lower and

correct criticism, and highly pleasing entertainment, in a work equally new and unequalled in design and execution, may be considered as decisive. “ If this estimable author, Thucydides, says the Abbé Barthelemy, employs *obsolete expressions or novel words*, it is because a mind like his can rarely accommodate itself to a language which is spoken by every body.” Travels of Anacharsis, &c. v. iii. p. 390, 3d Ed. Mr. Good in his ingenious work on the Diseases of Prisons and Poor Houses, p. 91, 94, objects to this acceptance of the sense of Thucydides, and as far as the words are supposed to relate to inguinal or axillary buboes, certainly on good grounds. In the subjoined case, had the patient recovered, there is a probability that the operation, which Lucretius says was sometimes resorted to in the case of the plague of Athens, would have been necessary, viz. emasculation, or the amputation of the penis at least. Hippocrates in several places mentions an affection of the scrotum and testicles in malignant and pestilential fevers. A remarkable case of this kind occurred in the month of May, 1794. Mr. O’Hara, an officer of his Majesty’s 56th regiment, uncommonly robust, and aged about twenty, having been seized with all the usual symptoms in the more violent degree of the Boulam fever, as it was then distinguished, had on the 4th day a very large discharge of purulent matter from the urethra, attended with very considerable swelling of the scrotum. The discharge continued to increase all the 5th, and I began to form a favourable prognostic from it. On the 6th, however, it became ichorous; the penis swelled to a monstrous size, as did the scrotum; and both began to change to a black colour. These unfavourable appearances increased rapidly the 7th and 8th, and the discharge became then a putrid sanies, excessively offensive. On the day of his death, the 9th, the scrotum was fully nine inches in diameter, and the penis three; and both were completely

and shriller than the natural one; the syllables are more distinguished, and the words are strangely lengthened out in a drawling or whining manner. In the patients who have sunk under this disease, the change of voice happens much earlier, and more remarkably than in others. It has, therefore, always afforded me a pretty certain prognostic of the event; for any alteration of the sound towards the natural one, is an almost certain sign of a favourable change. This change

pletely mortified and black. During the latter days of his illness, he lost a prodigious quantity of blood, from the nose, mouth, ears, eyes, and even from the pores of the skin. If we attribute this singular morbid disposition on the scrotum to the eruption of carbuncles, we shall be probably nearer the truth; and an observation of Dr. Ruffel's will remove every difficulty, and reconcile opposing opinions. "No external part whatever was exempt from the carbuncles. I have met with them every where, the penis and scrotum not excepted," p. 131. Dr. Rush says, he "met with several cases of swelled testicles, which had *succeeded* fevers so slight as to have required no medical aid." Med. Eng. and Ob. &c. vol. iv. p. 5. In the yellow remittent fever, the endemic, so called, swellings of the testicles have sometimes been met with. M. Desportes records events of this nature in the "Maladie de Siam;" but it appears that these affections of the testicles in his practice, were a kind of metastasis from swellings in the neck. "Il se faisoit quelquefois une métastase ou reflux de cette humeur sur les testicules, de façon qu'à mesure que le gonflement de ces parties augmentoit, celui de la gorge diminuoit; *ce que j'ai observé dans plusieurs, sur-tout dans ceux qui pouvoient n'avoir pas toujours été sages; c'est ce que je laisse à expliquer,*" tom. i. p. 112. See also p. 75, where the expressions "vers les parties inférieurs" leaves the reader in doubt as to the writer's precise meaning.

of voice is not expressly thus described by Dr. Ruffel; but that the organs of speech suffered severely in the plague is evident. “ Loss of speech, he says, was not an uncommon symptom. Faltering and trembling of the tongue, except in cases of extraordinary debility, seldom appeared earlier than the third day, &c.”*

A suppression of urine is by no means an uncommon symptom in the bilious remittents of hot climates; and, in general, it is a circumstance which often occurs in fevers of a synochus or typhus character: but in the malignant pestilential fever, it is particularly remarkable for its coming on early, its duration, and the cause which seems to produce it. In the third volume of the *Edinburgh Literary Essays*, there is a very ingenious and useful paper on the affection of the urinary bladder, which Dr. Gilchrist, the author, has called a “ thickening of the bladder.” To this I might refer for a description of the state of the bladder occasioning urinary suppression in this fever, for on dissection it appears exactly similar. Here I shall only observe, that the suppression is accompanied by a violent pain above the os pubis; a scalding in the urethra, a sense of fullness, without any visible turgescence in the region of

* *Treatise on the Plague*, p. 85.

the pubes; a considerable contraction and contortion of the penis: and the urine is generally of a very deep red colour; sometimes brownish; sometimes green; very frequently bloody; and, in a few instances, much inclining to black, and of an oily consistence. The smell of the urine was generally offensive in the highest degree. Indeed, all the excretions were remarkably foetid; but the stools were more especially so.

Constipation almost universally prevailed; a circumstance extremely unfavourable, as the means used to obviate it always increased the tendency to gangrene, by bringing on debility proportioned to their effect. This appeared to proceed from a suspension of tone in the intestinal canal; for on exciting the fibres to action, a redundant evacuation was generally the consequence. The coincidence of Dr. Ruffel's observation in the plague is remarkable, as well as the prognostic deducible from it. He says, "a number of the sick were disposed to be costive throughout the disease, and some had no stool for seven or eight days;" nor did this seem to be attended with any bad consequence.* The fœces at the commencement of the disease were seldom

* Treatise on the Plague, p. 94. He in another place expressly says "I never saw any acute distemper where costiveness was attended with so little inconveniency." p. 151, 153.

very foetid ; but, during its progress, became excessively so ; and, a little before death, when they were discharged insensibly, the smell was intolerable. The colour and consistence of this discharge varied much ; from yellow, or a yellowish white, to black ; and from a considerable degree of thickness, to the exact appearance of coffee-grounds.

The discharge by vomiting, which became a most dangerous symptom at the commencement of the low state, also varied much ; although for the most part poracious : but, towards the fatal crisis, always black, and resembling coffee badly boiled. Dr. Rush informs us that this symptom came on in the Philadelphia fever, about the 5th day. The protraction of the disease by the coldness or mildness of the climate, serves to be evinced by this circumstance. At Grenada it came on, in most instances, about the end of the 2d day, and was concomitant with the other more dangerous symptoms, such as cold surface, coma, &c.

The thirst was not very considerable in general, and no very useful indication could be drawn from the state of it. It was, however, a bad sign when the thirst ceased, especially if at the same time the tongue appeared parched, cracked, and black.

A symptom

A symptom of the plague described by Dr. Ruffel,* was pain at the heart. "The patients," he says, "often complained, my heart, my heart, or my heart pains me, or my heart is on fire." Similar sensations were perceived by the patients afflicted with the malignant pestilential fever. During the years 1793 and 1794, I did not remark this so distinctly as to consider it peculiar to, or in any manner diagnostic of the fever which then prevailed in the island of Grenada; but after my return to the West Indies in 1796, I met with it frequently; but more particularly among the natives of Ireland, labouring under a fever distinguished by the prominent symptoms of the malignant pestilential fever. These people almost universally complained of their heart at a certain period of the fever; and their doing so, with certainty, indicated a fatal termination. When desired to mention the symptom which most distressed them, "my heart, my heart," was always the answer; and this accompanied by a countenance singularly agitated, and marked with the deepest traces of despair. It is not a little singular that a sensation so strongly delineated by the expression and countenance of the patient,

† Treatise on the Plague, p. 84.

should be peculiar to the natives of Ireland.^x This symptom seemed to have been pointed out in the case of Mr. Walkens.

A principal distinction between the malignant pestilential fever, and the yellow remittent or typhus icterodes, is the yellow suffusion. This, in the former, never exceeded a dinginess, or a peculiar mixture of livid and a dirty yellow: in the latter, it is a deep saffron yellow. In the latter, probably the yellow colour takes place from the absorption of bile; in the former, from the action of the matter of infection: or shall we use the more indefinite but more fashionable phrase, from *some peculiar action in the blood-vessels*.

In negroes the manner in which this disease came on, was, in several respects, different from that in whites. Although the pulse was often 116 in the minute, yet the skin was cold, and anointed with oily sweat; the headach and pain in the back, and at the præcordia, were very violent; and the oppression and anxiety were apparently very considerable, for the patient's sighs and melancholy aspect indicated much internal perturbation: yet, with all this appearance of violence, the disease most readily yielded to simple evacuation. Seldom was it necessary to administer

^x. The author seems ignorant of the strikingly different ways in which the English, Scotch & Irish complain when ill of fever: the Scotch complain of pain in the head, the Irish of pain about the heart, the English

nister mercury, and seldom bark, unless to please the patient himself, or to remove the apprehension of his master.

Ideotism, or fatuity, took place in some instances of the malignant pestilential fever. In these this symptom occurred when the febrile heat, and other ardent symptoms of the first stage, had ceased; and continued four or five days. The body, during this state, was remarkably cool and moist; the tongue and gums were covered with a dark-coloured fur; and the eyes had an unmeaning stare. The mercury had not acted at the period this singular change took place; and as the tendency to coma, with cold sweats, and dingy suffusion on the surface, had come on, I entertained very faint hopes of their recovery. The medicine was pushed, and at length excited salivation; and from that moment the mind was restored to a rational state.

Whether the fever may be classed among the pestilential or not, I shall not take upon me to decide, but leave those to determine who have more leisure and fitter opportunities than I have had. I shall only observe, on this head, that if the eruption of buboes, carbuncles, and other swellings of the lymphatic glands, is considered as a necessary condition in fixing a pestilential character, they have not been unfrequent in the dis-

case before us. Buboes in the groins and arm-pits have occurred in several cases, but they have been uniformly the prognostic of death. Parotids have been rather more frequent, but in general were not more favourable than the buboes. I may here advert to an observation of Dr. Ruffel's, which the appearance of parotids, and their usual progress in this fever, have confirmed. "Where the case terminated fatally, the parotids never became soft, though sometimes inflamed externally; but increasing to a large size, the patient perished as if by suffocation." I recollect a case which occurred at Grenada precisely in point. A young man of the name of Simmons, a native of Bermudas, and captain of a coasting vessel, was, on the 30th of August, 1793, seized with the usual symptoms of the malignant pestilential fever in the second degree of violence. Having been at sea at the time, he could have no relief or assistance till the following day; and having been landed at a considerable distance from town, no regular attention could be paid him, so that the disease necessarily went through its natural course. The symptoms were moderate till the 9th day, when, after several hours of delirium, and other untoward signs, swellings of the parotids of each side began to appear. The increase of these was so surprisingly rapid, that the

the whole of the neck, and the greater part of the face, underwent a change of form. On the 13th day, whatever he attempted to swallow was returned chiefly through the nose; and the pain in these monstrous tumours was so exquisite, as to oblige him to keep constantly in a sitting posture, for any other produced a sensation resembling suffocation. On the 14th the tumours became gangrenous, and vibices appeared on all parts of the body. In the evening he died.

I have not seen carbuncles in any case which terminated fatally; but in many who recovered they were numerous, large, and very troublesome. These occurred chiefly in the young and robust; and always about the period the dangerous symptoms disappeared; and indeed so exactly did the appearance of the carbuncles fall in with the favourable change in the disease, that I have always considered them as a critical discharge; the only thing of the kind, except the purulent discharge from the scrotum and urethra, I have been able to observe in this fever.

One other species of eruption has also been observed in the malignant pestilential fever, viz. pustules similar to those of the distinct small-pox, filled with thin purulent matter, about the 5th, 7th, or 9th day; these and the resolution of the fever were concomitant.

The poison of the contagion of this disease seemed to give strength to those affections which are thought to be peculiar to the nervous system. A singular case, illustrative of this observation, took place at Fort Royal. In the month of August, 1796, I visited the naval hospital under the direction of Mr. Gilespie, and among a number of cases of the malignant pestilential fever one very singular was pointed out to me. The circumstances of it were these. Philip Key, a sailor of Admiral Harvey's ship, the Prince of Wales, had about five years before received a wound in the cheek which produced trismus only, without any symptoms of a more general spasm. This affection had continued, with more or less violence, from that time till about five days before I saw him, when, being in a ward where the infection of the malignant pestilential fever existed, he was suddenly seized with all the usual symptoms of that malady. Immediately after the spasm became general, and an opisthotonos was completely formed.

Most other diseases degenerated into, or partook very much of the nature of this. Dysenteries suddenly stopped, and were immediately succeeded by the symptoms of the pestilential fever. A remarkable instance of this occurred in the month of July, 1793. About the beginning

ginning of the month, twenty-seven recruits joined the detachment of royal artillery in Grenada. These men formed part of the artillery, which, with other troops under the command of Major General Bruce, landed on the island of Martinico about the middle of June. During the three days they remained on shore, they were encamped, and almost the whole time exposed to very heavy rain. Dyenteries were the consequence; and most of them, on their arrival at Grenada, were admitted into the royal artillery hospital; where at that time, as has been already observed, there were many cases of the pestilential fever. The apparent effect of the medicines they took very much surprised me; for in a few hours after the symptoms of the dysentery disappeared, those of the pestilential fever came on. Catarrhal complaints, simple at first, soon changed their nature: convalescents from other diseases were very subject to this, but it generally proved mild. Those labouring at the time under chronic complaints, particularly rheumatism and hepatitis, were also very subject to it. The puerperal fever became malignant, and of course fatal; and even among pregnant negro-women, who otherwise might have had it in the usual mild degree peculiar to that description of people, were reduced to a very dangerous

situation by it. In short, every disease, in which the patient was exposed to infection, sooner or later assumed the appearance, and acquired the danger of the pestilential fever. This assimilation of other diseases to the nature of the prevailing pestilence, has been noticed by Dr. Ruffel and others in the plague;* and Dr. Rush made the same observation in the Philadelphia fever of 1793-4.

* Ruffel on the Plague, p. 40, 58, 25, &c. Sydenham, C. 2. S. 2. Feb. pest. and Pestis An. 1665 and 6. Riverius de febre pest. and others.

CHAPTER IV.

Dissections.

THE danger attending the opening of bodies in this disease, prevented me from extending my enquiries this way so far as I otherwise would have done. I opened only five, the appearances in which I shall here give an account of. Three of the five were sailors, who died on the fifth day, and laboured under the worst symptoms of the disease. In one of them it began and terminated with convulsive paroxysms. The intestines were much inflated, inflamed, and sphacelated, particularly the duodenum, a little beyond the pylorus; the liver had shrunk to less than one half its natural size, was uncommonly flaccid, and of a colour nearly approaching to buff, or a mixture of yellow and that of ashes; the gall-bladder was flaccid and greyish, and contained a small quantity of very dark-coloured, ropery bile. The spleen and pancreas were in a natural state; but the lungs were highly inflamed, and of a livery texture and hue; a circumstance the more extraordinary, as no symp-

tom of marked pulmonary affection could be perceived during the existence of the disease. The bladder contained near three quarts of urine, and was dilated to considerably above the os pubis; and its coats were much thickened. This patient had been constantly tormented with pain, throughout the whole region of the pelvis, and almost a total suppression of urine.

The second was remarkably robust and athletic, and had been seized with the disease in the form of an aguish paroxysm; but died strongly convulsed. The viscera were in general in the same state, particularly the liver. All the blood-vessels of the intestines were uncommonly turgid; the right kidney was mortified; although, during his illness, no symptom of inflammation of that organ was perceived. The quantity of urine was small, although the suppression had been considerable; and the bladder, a good deal enlarged, felt much like an elastic gum-syringe; the coats were much thickened, but renitent.

The principal morbid appearances in the bodies of the third and fourth, I have already described. These two were the only subjects in which I examined the state of the brain. To what I have already said in the dissection of these two bodies, I have only to add, that the viscera of the abdomen and thorax were exactly in the same state

as the others ; and that one was a young man of the royal artillery, about eighteen years of age, who arrived with his master, Captain Irwin, of that corps, from England, about six weeks before ; was remarkably florid, robust, and lively ; and obstinately refused to avail himself of medical assistance during the whole of his illness. In the brain of this young man, the quantity of blood was surprisngly great ; for, exclusive of what was lost in opening the cranium, fully two pounds were collected. In the left ventricle the quantity of water was also considerable ; but there was none in the right. The fourth ventricle contained a larger quantity than ordinary ; and the plexus choroides was almost obliterated. There was no polypous concretion in either of the ventricles of the heart.

In the fifth, a young man of the royal artillery, just arrived from England, who died in twenty-nine hours from the commencement of the fever, the appearance of the viscera was precisely the same. This man's fever abated considerably on the breaking out of a copious diaphoresis ; his stomach was remarkably retentive, which enabled him to take at least two ounces of bark in a very few hours. As he was preparing to take a dose of this medicine, he felt a little uneasiness at his stomach, which induced him to defer it ; but on
laying

laying his head on the pillow, he expired without a groan, or the least struggle.

Mr. White, mate to the 45th regiment, who at that time attended the hospital of the regiment, with much and deserved credit to himself, opened several bodies of soldiers who died of the malignant pestilential fever; and he, in all, remarked the same appearances I have above described. He did not examine the brain in any instance, but from the symptoms, particularly the coma, delirium and dilatation of the pupils, being exactly similar, little doubt can remain with respect to the state of it.

I may here observe, that the appearances in the bodies of twenty which were opened at Brest, were almost exactly similar, that of the liver in particular, which M. Poissonnier says were livid, flaccid, and overspread with cencritious and blackish spots, under which were small drops of clotted and ill-conditioned blood—"le foie de plusieurs se trouve livide, mollesse, et parsemé de taches cendrées et noirâtres, sous lesquelles on apercevoit des gouttelletes de sang grumété et denaturé.*"

The only material difference which appears between the dissections described by Sir John

* *Maladies des Gens de Mer*, tom. i. p. 334.

Pringle, and those which were made at Grenada is, that in his three were abscesses in the brain ; whereas in these, a considerable quantity of ferous fluid in one, and of ferous fluid and blood in another, alone were found. But this difference, I apprehend, may be very readily accounted for by the very rapid progress of the disease in the latter, and the length of time to which those Sir John Pringle treated, were protracted. In the Grenada cases, the disease terminated fatally in five days ; in his, death did not happen till the expiration of a fortnight or a month.

Dr. Rush, with his usual acuteness of observation, has remarked that “ the morbid appearances of the internal parts of the body, as they appear by dissection after death, from the yellow fever, are different in different countries, and in the same countries in different years.”* An illustration of the first position, is furnished by himself in a paper describing the appearances on dissection, in several instances, drawn up by Drs. Physick and Cathrall, of Philadelphia. These gentlemen found the brain, in every instance, in a natural condition ; the stomach, and beginning of the duodenum, the parts most diseased ; and the liver, in general, unchanged. It will be dif-

* Account of the B. Y. Remitting Fever, p. 114.

ficult, however, to reconcile these appearances with many of the phœnomena of the disease; and a later dissection, as far as one instance goes, disproves the unaltered state of the brain described in this report.* Some West India practitioners have given an illustration of the second position of Dr. Rush's remark. Dr. Saunderson, of Tortola, in eighteen dissections, found none which corresponded with the appearances I have described, except the morbid state of some of the viscera. From the morbid state of the cystic duct in two instances, this gentleman was led to think differently from most physicians, with respect to the nature and cause of the black fluid discharged from the stomach in the malignant pestilential fever. In one of these instances, he found the cystic duct obliterated; in the other totally obstructed: concluding from these that the same morbid state would be more generally observed, if more generally and minutely enquired after; he took, thence, occasion to account for the difference perceived between the bile in the gall-bladder and that in the stomach; the former acquiring a ropery treackley consistence and dark colour, from its confinement, and the consequent absorption of its more fluid parts; from

* Account of the B. Y. Remitting fever; p. 122.

thence,

thence, also, he imagined, a decisive proof might be drawn of the black grumous matter found in the stomach, being blood and not bile.

Some dissections made at Boston in New England, correspond so exactly in every particular, except the appearance of the liver, which in them was enlarged, dark coloured, and greatly inflamed, as to furnish further proof of the identity of the American and West India epidemics of 1793, 4, 6, &c. The conclusions drawn by Messrs. Rand and Warren from these dissections, are judicious. They have been induced to adopt the treatment which depends on the saturation of the system with mercury.*

* Med. Repository, v. ii. p. 249. They refer to Dr. Rush and Dr. Clark, of Dominica, although my discovery of the utility of the practice was much prior to either.

CHAPTER V.

Prognostic and critical Days.

FROM the circumstances of the malignant pestilential fever, related in the foregoing sheets, it will readily appear that the mode of termination could not with certainty be foretold by any one of them alone. The particular state of any of the excretions, or the morbid appearance of any organ, unless the changes which took place in the other symptoms were at the same time attended to, could not afford any precise prognostic. In a word, it was only from attention to the general state of the patient, or the result of a combination of all the signs, we could form any idea of what the event might be. The state of the eyes, the change of voice, the general aspect of the countenance, and the degree of torpor or insensibility of the system, and the consequent and obstinate inactivity of the mercury already exhibited, afforded the worst; and the reverse of these, the most favourable prognostic; and from them much useful information might be obtained. Thus, also, I generally observed that

that the longer the symptoms of inflammatory diathesis continued, provided their violence was not progressive, the event become more favourable; and, on the contrary, that when the sudden disappearance of these was immediately succeeded by a seeming state of apyrexia, the worst symptoms, such as coma, delirium, clammy cold sweats, vibices, and death, might be soon expected. In the first case, the patient was gradually thrown into an agreeably warm and universal diaphoresis; irritability of stomach ceased; the eyes became more lively; and in a little while after, the signs of returning health were evident. The prognostic in the plague was drawn from the general state of the patient, and could not be ascertained by the state of any one function, nor the appearance of any one organ. Dr. Russell's idea relative to this part of his subject, exhibits a wonderful coincidence of the nature of both diseases. "It was the *muddy eyes*, which contributed chiefly in composing that confusion of countenance, which I shall not attempt to describe, but which enabled me, after some practice, to pronounce with tolerable certainty, whether the disease was or was not the plague, though not independently of other symptoms. When this *muddiness* disappeared or abated, it was constantly a favourable sign. The sudden loss of
strength

strength, and disturbance of the functions attributed to the brain and heart, are reckoned, in a particular manner, symptoms belonging to the plague. In their highest degree they distinguish the most fatal forms of the disease; and under different modifications adhere to all its varieties.*

It is a general observation, that in malignant fevers the critical periods are more distinctly marked than in any other; the disease before us afforded an additional proof of this. I have not met with any disease in the West Indies, in which these periods were not distinctly ascertained. The disappearance of the disease, or the death of the patient, always happened on the odd days; but the change in the state of the disease, which preceded either event, took place on even days. Thus, if the patient was worse on the evening of the second day, he would die on the third; if worse on the fourth, he would die on the fifth; and so on as far as the fourteenth day. Beyond that period, I have not seen an instance of the disease ending fatally, although it has been protracted, in a few instances, to the twenty-first day. In the same manner, if the patient felt better, or if there was an evident abatement of the symptoms on the 2d, 4th, 6th,

* Treatise on the Plague, p. 85—89.

&c. days, the revolution of the disease would happen on the following days. The accuracy of the critical periods was observed by Dr. Rush in the Philadelphia fever.

Perhaps the subjoined Table of the state of the patients in the royal artillery hospital, at Grenada, who recovered and died, may illustrate this point more fully than any other mode of explanation. I make choice of this in preference to any other part of my practice; in 1793, because there my observations were necessarily more accurate, and more faithfully recorded; and because few in private life enjoy the advantages which the sick of the royal artillery do; proceeding from the very liberal manner in which their hospitals are established, and supplied with the necessary diet, wines, and medicines. When to these are joined attention and professional skill on the part of their surgeons, which, notwithstanding their extremely and shamefully inadequate pay, have been very generally found conspicuous, success must be the consequence of exertion, unless circumstances of disease exist to render that ineffectual. This Table will also shew the result of my practice, in the four modes of treatment I at that time adopted. I shall detail them when I come to treat of the cure.

A TABLE, shewing the number that Died, and the Number that Recovered, under four different Modes of Treatment, in the Year 1793, of the Ordnance Department at Grenada.

MODES OF TREATMENT.	Died on the				Began to recover between the			
	29th H.	3d D.	5th D.	7th D.	9th D.	36th H. and 5th D.	7th D. and 9th D.	9th D. and 21st D.
Treatment with Mercury -	—	5	8	2	1	11	24	7
Treatment with Peruvian Bark -	1	—	3	—	4	—	3	4
Ruffian Treatment -	—	1	—	1	—	—	2	1
Treatment with Auguftura Bark -	—	—	—	—	—	2	3	—
Total -	1	6	11	3	5	13	31	12

CHAPTER VI.

Diagnostics of the Malignant Pestilential Fever ; and how far its Infection extended, considered.

THE history of the malignant pestilential fever, exhibits a very distinguishing character. We see in it a disease dispossessed of alternate paroxysms and remissions ; and having, in its progress, three distinct periods or stages : the first characterising an inflammatory diathesis of a peculiar nature, ushered in, generally, by a convulsive affection of the frame ; or a sudden morbid excitement of the nervous system : the second, a kind of suspension of all the animal functions, accompanied with a more or less imperfect exercise of the mental faculties : and the third, a general spasmus of the vital organs ; and a fatal compression of that more immediately employed in the support of animation.* In the first two periods nothing like a remission can be observed : in the third, there is sometimes seen an alterna-

* How much these features resemble those of the plague, a slight attention to the latter will demonstrate. See Ruffel on the Plague, book ii. ch. 2d and 3d.

tion of delirium and convulsion; and short intervals of reason and freedom from pain, which only serve to mark more strongly the insidious nature of the disease.

A slight attention to the history of the symptoms as they rise, will satisfy us that the principal distinction between the malignant pestilential fever, and yellow remitting fever, is the supervention, in the former, of a state, at a certain invariable period of the disease, in which a total absence of external, but an accession of a most pungent internal heat, with a singular change of pulse, take place. In the less violent cases of the fever, this state is not marked with much deficiency of recollection and sensibility, although there is always some tendency to coma, to drowsiness, and an uncommon degree of debility: but in those of a higher degree of malignity, sensibility and recollection are lost; and fatuity, deep coma, accompanied with a deadly coldness of the surface, clammy sweats, and permanent dilatation of the pupils, suddenly succeed them. The supervention of this state has no connexion whatsoever with apyrexia; nor with that abatement of the symptoms distinguished by the name of remission; for the pulse fully evinces the latent fever which then preys literally on the vitals of the patient. It constantly and uniformly happens

pens on the evening of the second or morning of the third day of the disease; and continues invariable till the change prognosticating recovery or death, appears. Then signs of the former are perceived, or convulsions precede the latter.

Besides this general and obvious distinction, there are other necessary circumstances of the malignant pestilential fever, which manifest a character of a nature different from that of yellow remittent fever. These are discovered in many of the symptoms. The delirium in the former is singular, and resembles that in the plague; being marked with the fatuity, silliness, and the stammering and faltering of the voice, peculiar to that malady; the delirium in the yellow remittent fever, is generally more of the wild, furious kind; and is seldom attended with the circumstances mentioned. The pains differed essentially. In the fever before us, the pain across the forehead also shoots inwardly, and seems to arise principally from an affection of the optic nerves. Exquisite torture is produced at the bottom of the orbits; and not unfrequently a temporary deprivation of sight, is one of its consequences. This is by no means generally observed in the yellow remitting fever; for in it the pain is perceived in every part of the head; is as violent in the occiput as in the sinciput; and

is not particularly felt at the bottom of the orbits. The singular affection of the pupils, so universally a symptom of the malignant pestilential fever, cannot be perceived in this ; for although a turgescence of the blood-vessels, and a filmy exudation on the surface of the ball, are never absent in the latter, yet dilatation of the pupils is not concomitant. I may safely add, that wherever the last symptom has been remarked, something more than the miasmata of marshes has been the cause of the disease. The pain confined to that part of the leg where the gastrocnemii and soleus muscles unite and form the tendo achillis, is peculiar to the malignant pestilential fever. The pains of the lower extremities, in the yellow remitting fever, are general, and are felt in the thigh as much as in the leg ; which I have never found to happen in the former.

The state of the pulse furnishes a remarkable diagnostic—variable ; slow, with evident external heat ; quick, with absence of heat at the surface ; not intermitting at any period of the disease ; but tremulous.

The frequency and extent of hæmorrhage in the malignant pestilential fever, seem to constitute a remarkable distinction ; for although hæmorrhage does sometimes take place in yellow remitting fever, it is by no means alarming ; and
much

much more frequently it does not at any period of the disease, happen.

The change of voice which uniformly occurs about the commencement of the second period of the malignant pestilential fever, demonstrates a peculiarity in the nature of the disease: a change such as this, I am confident, never has place in the progress of the yellow remitting fever.

Constipation is a constant attendant on the malignant pestilential fever; but is far from being remarkable in the yellow remitting fever.

The debility and oppression—the extreme despondency and depression of spirits—the insensibility and want of apprehension—the self-deception and suspension of memory—all tend to evince a peculiar character; or, at least, one differing essentially from that of the yellow remitting fever.

Another very material circumstance which presents itself as a distinguishing symptom between these fevers, is the discolouration of the skin at a certain period. In the malignant pestilential fever, the discolouration is not yellow but dingy, and such as is frequently produced on the extravasation of blood in consequence of contusion. In the yellow remitting fever it is a deep yellow; and such as bile tinges linen with. Dis-

fection discovers the cause of this diversity: in the former the biliary ducts are open and permeable: in the latter, almost always obstructed. I have already proposed a conjecture with respect to the cause of the dingy appearance in the malignant pestilential fever; and the consequences of the external application of poisons, or of local inflammation from any other cause, seem to constitute an evidence of the origin of this being the action of the poison of putrid animal effluvia on the system. It is hence that a mixture of bile in the fluid, vomited in the course of the yellow remittent fever, is considered as a very favourable circumstance, furnishing a proof of the obstruction of the biliary ducts being removed, and consequently of the dangerous state of the disease having terminated.

But the most remarkable distinction between the malignant pestilential fever, and the yellow remitting, is contagion.* Not a doubt remains
on

* The ingenious, experienced, and venerable Dr. Wright, has thus supported my opinion, without having seen my Essay, and without having any personal acquaintance with me, for it was not till towards the end of the year 1797 I was gratified with several interesting conversations with the Doctor, on this subject, at Barbadoes. "Some late authors, who have written on West India diseases, have roundly asserted, that in tropical countries fevers are not contagious; but whoever has had the care of crowded hospitals, of jails, of ships of war, or of transports full
of

on my mind, that the disease which prevailed in the West India Islands, in 1793, and 1794, but more especially at Grenada, was of a pestilential nature, proceeding from imported infection, and modified by certain local circumstances, and by climate. The manner in which the disease was introduced and propagated in 1793, constitutes a proof of this, which no cavilling doubts, no arguments formed by medical gentlemen who never saw it, who are under the influence of false combinations, or who are unacquainted with the climate and situation, can weaken or confute. I say, the most remarkable distinction between the fever which prevailed in the West India Islands in 1793, and 1794, and the yellow remitting fever, is contagion. The yellow remitting fever

of troops, must have seen numerous and fatal instances of contagion in the West Indies; more especially where cleanliness and free ventilation have been neglected. From causes of this sort a most fatal and destructive disorder broke out in the West Indies in 1793, and soon after in Philadelphia, viz. the yellow fever. Dr. Rush has classed this disorder with remittents; but every one who has practised in the West Indies, knows for certain, that the remitting fevers of warm countries are not contagious. From Dr. Rush's book, and from the numerous letters of my correspondents, there remains not a doubt, in my mind, of the yellow fever being typhus, exalted to a great degree of virulence from climate, situation, and other adventitious circumstances." *Med. Facts and Obs.* vol. 7th. This paper is dated Dec. 10th, 1794, fully two months before the publication of my *Essay on the Malignant Pestilential Fever*.

is endemic and sporadic; the other was epidemic, and imported from another country. The yellow remitting fever is always influenced by the weather; and, indeed, depends altogether on the heat of climate, and the temperature of the atmosphere; the other has been conceived to be peculiar to temperate and cold climates. The former is evidently caused by the miasmata of marshes, the exhalations from stagnant pools and ponds of water; or from humid places not exposed to the influence of the sun; heat; violent exercise in that heat; night air, and dews; and the abuse of spirituous liquors: the latter derives its origin from contagion alone. Many, and, in general, well authenticated facts, observed in situations totally unconnected with Grenada, except in the circumstance of infection having been derived from that island, render this matter still more evident. Two of these I shall beg leave to relate.

About the end of March, 1793, the ship *Herberts*, Captain Brown, sailed from the port of St. George, Grenada, for Glasgow. In working the ship out of the harbour, Captain Brown was obliged to send five of his men on board the *Defiance* of Blythe port, to fasten a warping line. At this time the malignant pestilential fever raged on board the *Defiance*. The day after the *Herberts*

berts failed, the five men were seized with the disease, and three of them died. Captain Brown attributed the recovery of the remaining two, to their getting into a colder climate before the disease had completed its course. By the following means the disease was prevented from spreading on board. Captain Brown had the long-boat fitted up for the accommodation of the rest of the crew, and took the mates into the cabin with himself; he strictly prohibited all intercourse with the infected; and, on the recovery of the two survivors, he had the steerage well washed, and frequently fumigated with moistened gunpowder, boiling tar, &c.; and he was particularly careful to destroy the bedding and wearing apparel of the five men who had been infected. These particulars Captain Brown obligingly favoured me with on his return to Grenada.

There are well-founded reasons for believing that much of the melancholy fate of the army collected at the Cove of Cork, under Major General White, about the end of the year 1795, for St. Domingo, is to be attributed to the infection of the malignant pestilential fever. The information which has led me to form this opinion, I received from gentlemen of that army, on whose authority I am confident the most perfect reliance may be placed. The ship I was on board of,
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having lost, on the 12th of December, the ill-fated fleet under the command of Rear Admiral Christian, was obliged to put into Cork harbour, where she remained till the St. Domingo armament sailed in the following February. During these ten weeks I had ample leisure to enquire and observe. A ship named the Generous Planter, employed in the transport service, had, in the month of May, 1795, carried part of the 29th regiment to the island of Grenada, where, owing to causes which shall be hereafter stated, the malignant pestilential fever prevailed with very considerably aggravated violence. During her stay there, having been employed as an hospital ship, her crew, and the troops she had on board at different periods, were extremely sickly. In the autumn she returned to England; but on her arrival, it does not appear that any precautions, at least such as were sufficient to eradicate the infection, were made use of; consequently it remained on board, at the time she was again taken into the transport service, and employed, with others, to carry the troops destined for St. Domingo. Part of the 39th regiment had the misfortune to be embarked in this ship from the encampment on Spike Island. The infection soon after manifested itself in the persons of the soldiers, already prepared to be acted on by it, by a series

series of predisposing causes of a very distressing nature. A most alarming fever spread throughout the whole fleet; and the Generous Planter was the source or focus of contagion. I am aware that some of the physicians, attached to this army, denied the existence of contagion, or of any source of infection; but a dispassionate and impartial investigation must have satisfied every reasonable mind, that a calamity so sudden, and so extensive, could arise from no other cause. Satisfied with respect to the nature of this dreadful fever, and dreading the extension of its infection to the inhabitants of the country, measures were adopted by General Vallancy, commanding the District, to prevent all communication; the chief, and most effectual of these, were confining the sick to the limited accommodations of Spike Island; a measure, doubtless, fatal to many of the soldiers, but necessary for the prevention of a more general evil. Some unequivocal proofs of what I have advanced, may fix conviction more perfectly than any reasoning. Mr. Hilton, at that time Surgeon to the 39th regiment, was attached to that part of the regiment on board the Malabar, East India-man, and declared that a soldier, who had been sent on board that ship from the Generous Planter, introduced the infection of the fever which universally

fully prevailed with so much fatality immediately after. The late Lieutenant Colonel Baillic of the 99th regiment, assured me that the first appearance of the fever on board his ship, the *Flora*, was about four days after four men of his regiment had returned to the ship, after having been detained a whole night by tempestuous weather in the *Generous Planter*. Until this unlucky communication, the 99th regiment had been remarkably healthy. Dr. Jackson, who had the direction of the hospitals of the St. Domingo army, acknowledged that the sick of the 39th regiment on board the *Generous Planter*, had symptoms which he had not observed before; and such as resembled much those described by me as peculiar to the malignant pestilential fever. These are strong evidences of a peculiar infection on board the *Generous Planter*; and leave little room to doubt that the majority of the cases I saw in the hospitals, were originally, or had been converted into those of its specific nature. The observations I had been able to make, myself, on several cases of this fever, only served to confirm this, however opposite they might have been to those made, or said to have been made, by many of the gentlemen of the hospitals. The comparative efficacy of the tonic treatment adopted by the physicians attending the hospitals on Spike Island,

Island, and that pursued by a medical gentleman of the 99th regiment, about three weeks after, in the same fever, may serve to establish the identity of the infection still more perfectly.* Under the tonic treatment a very great mortality took place: for I have the best authority for stating, that out of a body of infantry, not exceeding 5000 men, 1099 perished between the beginning of November and the end of January. The cavalry at that period had not suffered, but when they afterwards were exposed to the infection, a proportional mortality took place. Under the mercurial treatment, with circumstances extremely unfavourable, only four out of fifty died.

* See Part 4th chap. 15th of this Work. As a further proof of the existence of the infection of the malignant pestilential fever in transports returned from the West Indies, I may extract the following passage from a very useful pamphlet published in 1795, by a Mr. Wastall, surgeon, in London. “Another cause contributed not a little to support the contagion, was, that few paid the necessary attention to sweetening and ventilating their ships, when the disease ceased. From this circumstance, it frequently happened, that a healthy person, on entering those infected ships, were instantly struck with the infection. And what will still appear more extraordinary, I am told by a commander of a ship, who had the fever at Martinique, and who had visited some of the transports at Spithead, which have arrived from the West Indies the latter end of August, 1795, that he found the smell of this pestilential fever the instant he set his foot aboard of some of them.” See Directions for the Use of Medicines contained in the Sea Chest, &c. &c. p. 23.

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This cause gave a peculiar cast to the fever at Grenada, during the years 1793, and 1794; what features it assumed afterwards I am not acquainted with from observations made by myself: but from those made during my absence, by the late Mr. William Campbell, and other medical gentlemen of the island, I have every reason to believe that, during the year 1795, several causes contributed to strengthen its infection, and to render its features still more formidable. Similar causes not having existed in the other islands; time, aided, probably, by the means of eradication, employed; by the propensity observed in pestilential contagion to cease of itself; by the influence of the miasmata of marshes strengthening, as the other became weaker; and other means; has since changed the epidemic, and substituted one almost equally formidable, the endemic yellow remitting fever. It is not improbable, that the fever which prevailed in the West India Islands, owed its production, in some instances, to the united action of pestilential contagion, and the miasmata of marshes, and other direct causes of yellow remitting fever: and I am more inclined to think so, from remarking, that in the communications on this subject which I received, after my return to the West Indies, it appears, contagion had been observed to prevail
most

most unequivocally, in those situations where marshes least exist. Thus, at St. George's, Grenada; at Bridgetown, Barbadoes; at Kingston, St. Vincent; at Basseterre, and Brimstone-hill, St. Christopher's; at Roseau, Dominica; at the Ridge and Monk's hill, Antigua; at Charlestown, Nevis, &c. Contagion, undoubtedly, constituted the cause, or was a prominent feature of the fever which prevailed epidemically in those places in 1793. But, although in places where the exhalation of the miasmata of marshes certainly exists to a very considerable extent, the presence of contagion has been denied, in the years 1793, and 1794, yet I have just reason to suspect much allowance must be made for the influence of prejudice, false combinations, and defective observation, in those, who, in their statements, totally reject the association of foreign morbid causes in the production of the disease they describe. It is not to be understood, however, that I contend that marsh miasms had not a considerable share in the formation of the fever arising in such situations; I only maintain, what must be obvious to every reasonable and unprejudiced mind, that from the universal appearance of what has been called "yellow fever," in the West Indies, at nearly the same time, or rather in succession, we

shall find a difficulty not easily surmounted, if we attempt to account for its production, without the interposition or coadjuvancy of contagion or infection.

How far the infection diverged from its center or focal point, I am necessarily ignorant from the observations made by myself: but there are grounds of *probability at least*, that its extent was limited alone by the commercial intercourse which Grenada enjoyed with other countries at the time. This is a position I advanced in the first edition of my Essay on the Malignant Pestilential Fever, chiefly from facts which were then related to me. An opinion founded on a basis which does not comprehend the whole compass of its object, may be considered as too limited, and consequently insufficient to impress conviction on the public mind. Fully aware of the weight of an argument, which, however, is by no means divested of fallacy, I have taken some pains to enquire; and such information as I have obtained, inclines me to think that the assertion I have advanced is correct, viz. “ that the infection was not confined to Grenada alone; but from that, as a focus, it spread to the other islands, to Jamaica, St. Domingo,” Cuba, “ Philadelphia,” and other cities of the United States of America,

“ by

“ by means of vessels on board of which the infection was retained by the clothes, more especially the woollen jackets of the deceased sailors.”

In support of what I have thus stated, I shall relate a fact which I have been furnished with since the publication of my Essay. The ship which is the subject of the fact I am about to relate, was employed by the Board of Ordnance, for the purpose of carrying to the West Indies troops and ordnance stores, and sailed from Portsmouth under convoy of Admiral Christian's unfortunate squadron, in December, 1795: myself and five artillery officers were passengers in her. I received my information principally from Mr. Piree the first mate, a sensible judicious man, who acted in that capacity during the voyage in question; and was one of the few who escaped the calamity the whole crew were exposed to. The *Harmony*, belonging to Mr. Metcalf, of London, sailed, as a transport, from Plymouth, in February, 1795, having 214 men of the 81st regiment on board, under the command of a Major Watling. These men remained on board from their embarkation at Portsmouth, till their landing at Cape Nichola Mole, in St. Domingo, fully six months. During the whole of this long period there was not a single instance of sickness, a singular proof of the advantages which arise from the attention and

exertions of a good officer. This uncommon health proceeded from the following causes: 1st, The greatest attention to cleanliness: 2d, Complete ventilation, produced by a thorough draught of air, and wind-fails in the hatches: 3d, Keeping the men in an almost constant state of action, by dividing them into two watches only, one of which was kept on deck, whilst the other slept: 4th, Depriving them of births and mattresses, and obliging them to sleep on the boards with blankets only: 5th, Exciting among them an inclination to such amusement as prevented any dejection of mind, whilst it created agitation of body: and 6th, Preventing the generation of infection: 1st, By frequent scrubbing between decks; 2d, By insersion of boiling vinegar between decks; and 3d, By the use of the oil of tar: which was made use of in the following manner: Rags dipped in it were nailed to the beams along those parts of the space between decks, allotted to the soldiers for sleeping in; and the smell of these diffusing itself over every part of the ship, was no less penetrating than grateful. The soldiers having been landed, the *Harmony* proceeded to Port Royal, Jamaica, but still no sickness occurred among the crew. At that port, ten convalescent or invalid seamen were put on board to take their passage to England.

land. These men had been immediately before discharged from the hospital, where they had been confined for the "yellow fever," and were shipped without any care being taken to strip them of the clothes they wore in the hospital. They all relapsed, and spread the infection among the healthy crew, consisting of sixteen, including an agent and the ship's officers. Eight perished, and the remainder, except Mr. Piree and a boy, who were not infected, arrived in England in a most deplorable state. The agent and captain were two of the sufferers. The symptoms of this fatal malady, as far as could be collected from Mr. Piree's account, were exactly similar to those of the fever which prevailed at Grenada, in 1793, and 1794, particularly the fatuity or seeming state of intoxication, the protrusion and staring of the eyes, the pains in the forehead, and at the calves of the legs, and the oppression or pain at the pit of the stomach. He added, that in most instances, the sick walked the decks totally unconscious of their danger, and always professing themselves free from disease. The smell from the cabin in which the captain and agent died; and from the steerage where the seamen lay, was excessively offensive, and so penetrating as to be perceptible in all parts of the ship. Being, after her return to England, taken into the service of

the Board of Ordnance, at Woolwich, just before her cargo of stores was shipped, Mr. Cruickshank, chymist to the Ordnance, fumigated her. It is highly probable, however, that the infection was not totally eradicated; for when her cargo was partially taken out at St. Lucia, and she became the hospital ship to the Ordnance department of Sir Ralph Abercromby's army, during the campaign of 1796, an uncommon and marked malignity of a pestilential nature distinguished all the cases of fever, which, when received on board, had no other appearance than that of the common bilious remittent of the country. So difficult is it to destroy infection; and so readily do its effluvia evolve in a warm climate!

From the circumstances stated in the foregoing narrative, we are induced to believe that the infection of the malignant pestilential fever had penetrated as far as Jamaica; but the manner in which it was imported into that island, my information is not sufficiently correct to account for.*

Dr.

* The origin of the pestilential fever which prevailed at Jamaica, is ascribed by Dr. Walker, of that island, to a ship from Grenada; which was supposed to have introduced it into Port Royal. Med. Rep. vol. i. p. 471. Although the compilers of the Repository are disinclined to admit the importation of the disease into Jamaica, yet the assertion seems to acquire confirmation from the history of the Harmony. I have not seen Dr. Walker's paper itself, but the

Dr. M'Lean maintains, and apparently on very just grounds, that no source of infection could be traced at St. Domingo, by the medical gentlemen

the extract given in the Repository presents us with a description of the fever, which removes every doubt of its having been the malignant pestilential fever of Grenada. In the year 1795, when the pestilential infection probably began to cease of itself, the prevalent fever assumed a character considerably different. In 1793 and 4, it never intermitted or remitted; in 1795, remissions were evident. The cure was effected by the large exhibition, of calomel with the intention of exciting ptyalism. I have the authority of Captain Richard Hamilton, of the Royal British Artillery, and other officers, then stationed at Jamaica, for believing that the infection was introduced into Port Royal about the month of May or June, 1794, by the flank companies sent to St. Domingo, under the command of Colonel Lennox, who touched there in their way. These companies were detached from Sir Charles Grey's army at an evil hour—when Victor Hugues threw into Guadaloupe his handful of enthusiastic desperadoes, and thereby nearly ruined the British interest in the West Indies. A more full account of the fate of this unfortunate detachment is given by the celebrated Mr. Bryan Edwards; and gives confirmation to the authority of Captain Hamilton. Mr. Edwards, after giving a most afflicting picture of the disastrous situation of the British forces at Port au Prince, under the command of General White, after the reduction of that important but unhealthy post, on the 4th of June, 1794, where he says “they dropt like the leaves in autumn, until at length the garrison became so diminished and enfeebled, that deficiencies of the guards were oftentimes made up from convalescents, who were scarcely able to stand under their arms;” he thus states the condition of the detachment under Colonel Lennox. “It is true that a reinforcement came from the Windward Islands, soon after the surrender of the town; but by a mournful fatality, this apparent augmentation of the strength of the garrison, contributed

men of the British army there. In a country of which, Desportes says “ les deux tieres font Esteres, c’est à dire des salines très boueuses et mare-

in an eminent degree to the rapid increase and aggravation of its miseries. On the 8th of June, eight flank companies belonging to the 22d, 23d, 35th, and 41st regiments, arrived at Port au Prince, under the command of Lieutenant Colonel Lennox. They consisted, on their embarkation, of about 70 men each, but the aggregate number, when landed, was not quite 300. The four grenadier companies in particular, were nearly annihilated. The frigate in which they were conveyed, became a *house of pestilence*. Upwards of 100 of their number were buried in the deep, in the short passage between Guadaloupe and Jamaica, and 150 were left in a dying state at Port Royal. The wretched remains of the whole detachment discovered, on their landing at Port au Prince, that they came—not to participate in the glories of conquest, but—to perish themselves within the walls of an hospital! So rapid was the mortality in the British army, after their arrival, that no less than 40 officers, and upwards of 600 rank and file met an untimely death, without a contest with any other enemy than sickness, in the short space of two months after the surrender of the town.” History of St. Domingo, &c. p. 163.

The infection of this fever seems to have been imported into Cuba, or Havannah at least, by a vessel from Philadelphia, in the year 1794. In about two months, more than 2000 persons of every description perished by it; and as the symptoms were such as I have described, little doubt can be entertained of the identity of the disease. From the great number of deaths, a suspicion respecting the *surprising* efficacy attributed to the exhibition of Mr. Holliday’s purgative, composed of Glauber’s salts, manna and tamarinds, naturally arises. *Bleeding* was found universally injurious. See a small pamphlet on the Origin, Symptoms, and Treatment of the Putrid Bilious Fever, at the Havannah, in the months of June, July, and August, 1794, by John Holliday, Surgeon.

cageuses,

cageuses, remplies de mangles ou Jambes de Chien;" and where "l'humidité excessive, un air chaud et brulant, les exhalaisons putrides de toutes sortes de substances, nous font assez sentir quel caractère de pourriture cette atmosphère doit imprimer, aux corps organiques des animaux;*" the aid of foreign morbid causes is not necessary for the production of the most formidable tropical diseases. It is to be presumed that this state of country has been much improved by the industry of European French colonizing it during a period of forty-eight years; but still we must necessarily assign the fever, which is the principal subject of Dr. McLean's work, to the endemic and local morbid causes he attributes it to. He seems, however, to perceive a difficulty in accounting for the prevalence of "the remittent fever of St. Domingo" in situations, which, he says, are not marshy. "It must be admitted too, that fatal miasmata arise where there are no very certain appearances of marshy soil. The Mole, and St. Mark's, do not appear surrounded with marshes, yet the fever reigns in both these places with great activity."† It is not my wish to enter

* Histoire des Maladies de St. Domingue, tom i. p. 16.

† An Enquiry into the Nature and Causes of the great Mortality among the Troops at St. Domingo, p. 25. How can this be well reconciled with Mr. Edwards's statement?

into any controversy on this subject: the elucidation of a very important point, is the sole object of the remark I now offer; and such may well be expected from a gentleman of the abilities Dr. McLean appears to be possessed of.

It was not my intention to enter into any disquisition relative to the Philadelphia fever. I threw out a hint that the disease derived its origin from infection, introduced from the West India Islands, because I felt a strong conviction of the probability of such an event, from the constant intercourse between Grenada and Philadelphia; and from the information I received at the time; and, indeed, I confess I had no conception that a disease, fraught with contagion, and other unequivocal marks of pestilence, could have been assigned, in that climate at least, to endemic or local causes, or rather to the exhalations from corrupting vegetable substances. Dr. Rush, I find, has taken up the subject, under a persuasion that my assertion proceeded from want of information, and from my being unacquainted with the history of the yellow fever of Philadelphia, in the year 1793; and on the ground of a supposed difference of cause, he denies that the fevers were the same.* No man can possibly entertain a

* Medical Enq. and Obs. vol. iv. p. 113.

higher opinion of the humanity, the genius, and the professional skill of Dr. Rush, than myself; and I am happy on all occasions to avow my sentiments in these respects; but on the present, the cause of truth is paramount to all other considerations; and the Doctor will forgive me, if I shew an inclination to differ from him, on one point at least.

Although Dr. Rush, in almost every page of his very excellent publication on the fever of Philadelphia, admits contagion as a principal feature of it, in the fullest extent, yet he accounts for the origin of that dreadful malady, in a manner extremely unsatisfactory. And it is singular that, although the effluvia arising from damaged coffee, or coffee in a putrid state, are sedulously held out as the cause of this fever, no statement whatever of the circumstances of the vessel which carried that article into the port of Philadelphia, is given. To ascertain the sufficiency of this as a cause of so extensive a calamity, the absence or inefficacy of every other, equally probable, one would imagine, should be proved; but this is not attempted: so that, in fact, the information of Dr. Foulkes, on which Dr. Rush rests his authority, can be considered in no other light than conjecture. Is it not just as probable, that the importation of the persons of men labouring
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under an infectious disease, or of clothes imbued with the infection of it, were the cause? I certainly had good grounds for asserting that this actually happened in the year 1793: but it is difficult to bring forward these grounds after a lapse of five or six years, when the authorities from which I drew them, are either dead, forgot, inaccessible, or destroyed. The insurrection at Grenada, proved destructive to most of my papers, and among them were such documents as I possessed respecting this subject. The general tenor of their contents however were, that on board the vessel which carried the damaged coffee into the port of Philadelphia, several white men, sailors, were ill of the disease which afterwards ravaged the city; that these men were carried to a boarding-house, where they all died; that by them the disease was communicated to the family in the first instance; and that from them it spread through the street in which the boarding-house stood, and afterwards became general. Without laying more stress on this imperfect evidence than it may be thought to merit, I may observe that it is remarkable that a striking coincidence appears between it, and what is stated in Dr. Hutchinson's letter to the health-officer. After mentioning the opinion that the contagion originated from some damaged coffee, or other putrified

trified vegetable and animal matters, he adds, “ should, however, Dr. Say’s opinion (who had attended more in the disease, than any other physician) be well founded, that he observed the disease in Kenfington previously to its appearance in Water-street, this cannot be the original cause of the contagion.”*

But why should the testimony of those who were present at the commencement, and during the whole of the progress of the disease; but whose observations have inclined them to give a different opinion of its cause; be discredited? A strong contemporary authority is presented in Mr. Carey’s Account of the Malignant Fever; for the circumstance of his not being a physician I do not consider as an objection of any weight in an enquiry of this nature; an intelligent mind, aided by good information, and a habit of observation, not requiring professional knowledge to ascertain the importation of infection into a country. In the fourth Edition of this work, published fully five months after “ the bilious remitting yellow fever” made its appearance in Philadelphia, we are told that “ this disorder had most unquestionably been imported from the West Indies;” but that, hitherto, owing to various,

† An Account of the Bilious Remitting Yellow Fever, p. 20.

and obvious reasons, it was difficult to fix, with absolute precision, on the vessel or vessels (for it is very probable it came in several, from the different infected islands) by which it was introduced." The reasons offered by Mr. Carey certainly render it highly probable, that this actually happened; and I concur with him in thinking that each reason singly justifies the theory, but that all collectively, establish it to the satisfaction of every candid and reasonable man. The most cogent of these are the following: various vessels from the West India Islands arrived at Philadelphia in July. *Scarcely any precautions were used to guard against the disorder.* A vessel from Cape François, which arrived at Philadelphia in July, lost several of her people with this fever, on her passage. A person from Cape François died of this fever at Marcus Hook, and another at Chester. *The vessels in which these persons arrived, and which were infected with the effluvia of the sick and dead, came freely to the wharves, and particularly to that very one where the disorder made its first appearance.* Persons sick of the yellow fever were landed in Philadelphia from vessels arrived from the West Indies. *There is the strongest reason to believe that the beds and bedding of the sick and dead were not destroyed, but, on the contrary, brought into the city.* Two months having elapsed from the disappearance of
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the yellow fever till the time these reasons were offered to the public, sufficient opportunity was given to discover their want of validity. Objections probably were made, but to these Mr. Carey has opposed, that until his reason was convinced, he could not change his opinion for that of any person whatever.*

How far the effluvia of damaged or putrified coffee may be justly considered as a cause adequate to the production of so extensive and so fatal an effect, in such circumstances as those stated by Dr. Rush, I shall not take upon me to decide. Perhaps, indeed, a temperate climate may have powers to communicate to the effluvia of corrupted coffee, a degree of morbid activity they certainly do not possess in a hot climate: for it is a fact, established by long and universal observation, that on coffee plantations during the crop season, where a fœtor arising from coffee, in every stage of putrefaction, is almost unsupportably offensive, the inhabitants are not in the smallest degree morbidly affected by it.

The miasmata of marshes, to which Dr. Rush attributes the fever of 1794, at Philadelphia, certainly possess ample powers to produce the yellow remitting fever, properly so called. But

* See Mr. Carey's preface to his 3d Ed. and 4th Ed. p. 68.

if the fever of Grenada, and that of Philadelphia, New York, and of other towns of the United States, were the same, and we have much reason to believe they were, a cause essentially different must be sought for; and perhaps was the truth of the following passages admitted, and their applicability on the present occasion attended to, much light might be thrown on the subject, and the opposing sentiments of physicians reconciled. It is to be regretted, that the most ingenious theorists are not always the best judges of the admissibility of facts, however well authenticated. They are too often led away by the blaze of their own ingenuity, and truth is far outstripped in the unequal career. The gaseous oxyd of azote is universally the production of corrupted substances; consequently the exhalations from gutters, dung-hills, ponds, or marshes, are all equally efficient in exciting the most pestilential derangement of the human body. This being the *fine qua non*, the obvious cause, imported infection, is rejected as a circumstance bordering on impossibility. In Mr. Webster's Collection of Papers on the Subject of Bilious Fevers, prevalent in the United States for a few years past, there are very candid and judicious communications from two medical gentlemen at New Haven, in which the importation of infection is considered as the indisputable cause
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of the pestilential fever which reigned there in the year 1794. Dr. Monson, jun. informs us, that, “ on examination, it appeared, that, in the beginning of June, Captain Truman arrived from Martinico, in a sloop that was infected with the contagion of the yellow fever: that this vessel lay at the wharf, within a few rods of Isaac Gorham’s house: that she had on board a chest of clothes, which had belonged to a mariner, who died of the fever at Martinico; that this chest was carried into Mr. Austin’s store, and opened in the presence of Captain Truman, Mr. Austin, Henry Hubbard, and Polly Gorham; the three last mentioned of whom died in a short time after their exposure to the contents of the chest. Hence it is highly probable, that Mrs. Gorham (the first victim to the disease) caught the disease from the infected sloop or clothing. Mr. Austin’s store stands within three or four rods of Isaac Gorham’s house; and no person in town was known to have the yellow fever previous to Captain Truman’s arrival.” He afterwards declares “ he could trace the disease throughout the town; and that no person had the yellow fever, unless in consequence of attending the sick, or of being exposed as nurses, or to infected houses, clothing, or furniture.” In respect to

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sideration, he says, " I esteem it justifiable to reason from facts alone. I am fully of opinion that the yellow fever is seldom, or never, generated in this country, and that it is always imported from abroad. An objection to the idea of its being generated in this country is, that it was never known in the interior of this state, or of the United States, so far as I can learn." " If the citizens of large commercial cities," he very properly remarks, " were attentive in tracing the origin of the yellow fever, on its first appearance among them, they would often find that the disease was imported. In some instances it would be extremely difficult to discover the origin : but the mischief lies in this, that the inhabitants of such cities, whenever a contagious disease makes its appearance among them, endeavour to suppress all rumour of it, from an apprehension of alarming the country, and injuring their commerce : unwilling to believe that there is evil in the city, till the disease spreads in every direction. But as whenever the yellow fever has appeared in the United States, it has always been in seaport towns, and originated near wharves, docks, and warehouses, there seems to be high probability that the disease is imported."* Similar observa-

* A Collection of Papers on the Subject of Bilious Fevers, &c. compiled by Noah Webster, jun. p. 175 to 193.

tions are made by Dr. Manson, sen. in another paper in the same collection. I am not to be informed that these gentlemen stand almost alone in their opinion : but let it be observed that it is an opinion formed from the consideration of “ the most obvious facts.” To these observations, Dr. Rush is satisfied with opposing general remarks, which appear to me to be destitute of that force, energy, and authority, necessary to secure refutation. The Doctor says, “ in New Haven only, where the yellow fever was epidemic, it was said to have been imported from Martinique. It is possible this was the case, but I suspect that this fever has often been ascribed to importation, from the circumstance of its appearing first on board ships, and among sailors, who have just arrived from West India voyages, into whom the seeds of the fever are often conveyed, by the proximity of the ships to filthy wharves and docks, and in whom they are afterwards excited into action by hard labour and intemperance. But where this is not the case, I believe the disease is sometimes excited by the effluvia of such parts of the cargoes of ships as are capable of putrefaction, and which act with morbid force as soon as they are brought into contact with the air.”*

* Med. Enq. and Obs. vol. iv. p. 68.

But will this reasoning apply to the origin of the fever at New Haven, and other places, where the facts have been minutely traced, and correctly stated? If the circumstances of the Philadelphia and New Haven fevers are found to be precisely the same in every point, except that which is the object of the present enquiry, is it not reasonable to suppose that that *duly* and *early* traced,* would have been also found similar? At New Haven,

* An illustration of this is furnished by one of the physicians of New York. Dr. Seaman, who came forward about the middle of the year 1795, as a professed advocate for the endemic origin of the fever which prevailed in that city; and, in his communication to the committee of health, gave his decided suffrage against the opinion of imported infection, and of the propagation of the fever by contagion, (See Webster's Collection of Papers, p. 1 to 42) lays down as established principles in 1797, that,

1. The general cause of the yellow fever, as it appeared in this city, is what chemists call a *tertium quid*, neither one thing nor the other, but a result of the junction of certain matters emitted from a human body, labouring under such a disease, with the effluvia arising from vegetable substances in a state of putrefaction.

2. That putrid effluvia may, possibly, of themselves, generate the disease in persons highly predisposed, and from whom, by their assistance, the fatal epidemic may be spread through a neighbourhood.

3. That most probably, the spark that has kindled up the putrid vapours, in certain parts of our city, into action, was originally introduced from other places. And,

4. That as I have uniformly believed, and repeatedly expressed, that no yellow fever can spread, but by the influence of putrid effluvia." See Med. Rep. No. 3. Art. 2.

we see that the investigation was early ; and the result has established the importation of infection to be an undisputable fact.

Dr. Rush states a difference to have existed between the Grenada and Philadelphia fevers ; in their origin ; in the former having been produced by imported infection ; in the radius of infection ; and in a mixed fever having prevailed at the same time with the malignant pestilential fever at Grenada. The first of these supposed grounds of difference I have perhaps too diffusely discussed. On the second, I have only to observe, that the true uncombined yellow remitting fever, deriving its origin from the miasmata of marshes, and the various exhalations proceeding from putrid vegetable substances, confined humidity, and stagnant water, is not contagious ; nor can it be proved to be so, in any instance of the torrid zone at least. On the third, I beg leave to repeat what I have remarked in another part of this work, on an observation of Dr. Lind's, that both accounts may be reconciled, by allowing for the influence of heat in the tropic climate, occasioning such a degree of rarefaction of the air as to prevent the diffusion of contagion beyond the atmosphere immediately surrounding the diseased or infected body, the radius of which may be estimated at six or ten feet. With respect to the

fourth, I have only to say, that, as I stated nothing of this kind in my Essay, so it cannot be said to have existed. I have mentioned, indeed, that for some time after the malignant pestilential fever appeared at Grenada, an opinion was entertained by some, that it was the yellow fever of the West Indies, engrafted on the European jail fever; but it does not follow that I embraced the same way of thinking. I have likewise stated, that all other diseases gave place to this formidable and predominating fever; but I have nowhere said that they continued to prevail at the same time.

From what I have already said on this subject, I presume it has been made sufficiently manifest, that the malignant pestilential fever of Grenada, and the bilious remitting yellow fever of Philadelphia, were the same disease, modified, perhaps, by the obvious difference of climate and situation: were more necessary to establish this; a comparison of many of the circumstances of both would furnish ample evidence.* For this purpose

* The President of Congress of the United States of America thus addressed the legislative body on December 8th, 1793. "While with reverence and resignation we contemplate the dispensations of Divine Providence, in the alarming and destructive pestilence with which several of our cities and towns have been visited, there is cause for gratitude, and mutual congratulation, that the malady has

pose it may suffice to point out where the resemblance principally exists. It is manifested—in the time which the contagion takes to act on the system; in the distance at which the contagion affects the persons exposed to it; in the manner in which the contagion was communicated, after the first introduction of it into the country; in the predisposing causes; in the smell of the contagious effluvia; in the state of the patient for some time after the disappearance of

has disappeared, and that we are again permitted to assemble in safety at the seat of government for the discharge of our important duties. But when we reflect that this fatal disease has, within a few years, made repeated ravages in some of our principal sea-port towns, and with increased malignity, and when we consider the magnitude of the evils arising from the interruption of public and private business, whereby the national interests are deeply affected, I think it my duty to invite the legislature of the union to examine the expediency of establishing suitable regulations in aid of the health laws of the states; for these being formed on the idea that contagious sickness may be communicated through the channels of commerce, there seems to be a necessity that Congress, who alone can regulate trade, should frame a system which, while it may tend to preserve the general health, may be compatible with the interests of commerce, and the safety of the revenue.” The Sun of January 21, 1799. In another paper of January 23, it is observed, that “the country (United States of America) in general is now so convinced that the yellow fever is an imported malady, and has, in all places where it broke out, been so perfectly traced to the vessels by which it was brought, that the two houses (the senate and house of representatives) are about to enact a law for the rigorous establishment of quarantines. We sincerely hope the remedy will be effectual.”

the fever; in the period of the twenty-four hours at which the fever made its attack; in the suddenness of the attack; in the symptoms, more especially the general expression of the countenance; and of the eyes; the flushed face; the dilated pupil; self-deception and insensibility; the state of the pulse; the hæmorrhages; the convulsive or spasmodic state of the stomach, rejecting with force whatever has been thrown into it; constipation; the accession of the disease in convulsion and apoplexy; morbid strength; depression of spirits and suspension of memory; the seat and nature of the pains; disrelish for wines, and appetite for malt liquors; the affection of the lymphatic and glandular system in buboes, parotids and swellings of the testicles; the eruptions, &c.* The same resemblance likewise appears in the prognostics and critical days; in the classification of the subjects of the disease; in its predominancy over all other diseases, and propensity to reign alone; in the inutility of prophylactics; in its similarity to the plague; in the inefficacy of, and injury done by the administration of tonics in general; and, lastly, in the wonderful and universal success experienced from salivation excited by the judicious exhibition of mercury.

I will not, however, to conceal that in a very few material points the diseases appear to have

**. Tho' the author has certainly offered many strong arguments to believe that Contagion was at least combined with the Epidemic, yet it is evident that he has strained his proofs too far on many points.*

differed. 1. Dr. Rush informs us, that reinfection was very common in the fever at Philadelphia.* This, I am confident, I never experienced at Grenada; and in this respect the malignant pestilential fever bears a closer resemblance to the plague, than the fever of Philadelphia. We are informed by Dr. P. Ruffel, that it appears from his journals and memoranda, that in four thousand four hundred pestilential cases, he only met with twenty-eight of reinfection, well ascertained; a proportion, he adds, much under what he expected, and which may account for some practitioners not having met with them at all.† Indeed, from the expression made use of by Dr. Rush, there is room given to suspect that the cases of reinfection he met with, were, in truth, cases of relapse; an occurrence by no means uncommon at Grenada, when the treatment was improperly conducted. I am well aware, that it is a general observation, that the yellow remitting fever of the West Indies attacks only once; but this observation extends only to those who uninterruptedly reside in the climate, and whose tenor of life is uniform; for an interval of a few months spent in a cold climate, or, even, in some instances, in another island, the local circumstances

* Account of the Bilious Remittent Yellow Fever, p. 3.

† Treatise on the Plague, p. 190.

have noticed as occurring in the worst cases of the Remittent fever, not only in the W. Indies but in other places, and under circumstances that very suspicion of contagion was done away. See among others Hunter's description of the Bilious Remittent of Jamaica, in his very candid treatise.

of which are different, renews the disposition to be acted on by the causes, and consequently creates an aptitude, unless the utmost prudence is observed, to the recurrence of yellow fever. A sudden change of living, and consequent habit or temperament of body, creates the same morbid predisposition, and the same propensity to an attack of the endemic. What I have remarked, in this respect, at Grenada, exhibits a strongly marked distinction between the yellow remittent fever, and that in question. Many who had resided long in the island, without change, and without suffering by endemic causes, were seized with the malignant pestilential fever, and in a degree of violence proportioned to their length of residence^x, and to the degree of concentration of the infection. How far a similar event may take place in pestilential, or fevers depending on infection, after a temporary change of climate, I am not sufficiently qualified to judge. In my own person, and in those of some gentlemen of my acquaintance, no such aptitude to the recurrence of the malignant pestilential fever has appeared, although exposed to the infection of contagious fevers.

2. A difference is also perceived in the state of the remissions. In the malignant pestilential fever remissions were scarcely perceived in any case;

x. Here the author directly contradicts his own and, as pointed out before p. 128, viz that the Contagion operated less violently on the resident inhabitants

and, in general, nothing of this kind happened. The course of the disease was confined to three stages, or periods, so distinctly defined, as to preclude a possibility of mistake or doubt. Dr. Rush says, that in every case of the bilious remitting yellow fever, which came under his notice, there were evident remissions or intermissions of the fever, or of such symptoms as were substituted for fever:* and in the year 1794, he says, every case of the fever came on fraught with paroxysms.†

3. It has been observed by Dr. Rush, that the negro-race took the disease in common with the white people, and many of them died with it. This differs materially from what occurred among the same race in Grenada: but the circumstances of these people were extremely different. The diet, the habits of life, and the climate, the negroes of Philadelphia enjoy, I have no doubt, produce a total change of idiosyncrasy: they no longer retain of the negro-race any distinctive mark of character but the colour; hence they become subject to the influence of the existing causes of diseases, in as extensive a degree as the whites. The West India negroes, even those who are born free, or who have obtained their

* Account of the Bilious Remitting Yellow Fever, p. 78.

† Med. Enq. and Obs. vol. iv. p. 48.

freedom,

freedom, as well as the slaves, are very differently circumstanced: and as the climate and their habits and diet, are little dissimilar to those of their aboriginal country, so do the peculiarities of the negro constitution, remain unchanged in them.

The contemplation of the comparative features of the Philadelphia and Grenada fevers has drawn from Dr. Trotter a remark of infinite importance to society, but which seems to have been directed to invalidate my opinion of the nature of the malignant pestilential fever. "It is certainly," says the Doctor, "of great consequence to the peace and security of society, that physicians should be particular in investigating the sources of contagious diseases, and every candid mind ought to guard against any bias from opinions of theory."* In answer to this remark it is unnecessary to say much—It is not probable, even Dr. Trotter will allow, that after sixteen years spent in the habits of observation, and faithful discrimination of facts, within the tropics, the climate of which differs so widely from that in which the theory alluded to had its origin, I should regulate my opinions by the dreams and extravagancies of theorists. A successful practice in hot climates at least, is in the direct ratio of the discriminating powers, the fortitude, and the perseverance of

* *Medicina Nautica*, p. 332.

the practitioner. But the question on the present occasion to be determined, is—which of the two extremes is most pernicious to society—that disbelief of infection which leads to apathy in the selection and application of the means of prevention—or that general alarm which powerfully impels to fly from infection, and which gives rise to necessary and active exertions in destroying the seeds of it. But, perhaps, the authority of Dr. Lind may recall the mind of the reader to the just consideration of this weighty subject—“Notwithstanding,” says that judicious and experienced physician, “the difficulties that must always attend an enquiry into the nature and properties of infection, and the influence of various causes in its operations, yet, there are, perhaps, but few subjects on which the vulgar and inexperienced so freely give a decisive judgment. But in no point ought we to be more cautious in admitting a decision, especially a negative one, than in this, which is often so highly interesting to the public and private safety.” “Many countries and cities, in all human probability, might have escaped the dreadful scourge of the pestilence, by taking the proper measures, on its first appearance; if, on such occasions, the incredulity of a few had not generally been so great, as at its first breaking forth to deem it merely a fever void of infection.

Their

Their reasons were, because no marks of contagion were found on the dead bodies, because its progress was slow, because it raged chiefly at first among the poorer sort; and might be owing to poverty, to corrupt food, unwholesome drink, or to many other conjectural causes.”*

* Dr. Lind's Dissertation on Fevers and Infection. Ch. ii. Sect. v. See also Dr. P. Ruffel on the Plague. p. 250.

CHAPTER VII.

The Diagnostics of the Yellow Remitting Fever of the West Indies, in contradistinction to those of the Malignant Pestilential Fever.

THE fever which chiefly prevailed among the troops and in the navy, from the beginning of April, 1796, till about the month of March, 1799, when I gave up the army medical charge I held, was either the simple remittent, or the more formidable yellow remittent bilious fever of the country. After the campaign of 1796, the latter became epidemic in situations where the causes were most abundant; in others, where these causes, particularly the miasmata of marshes, did not exist, or only to a trifling extent, the troops continued in health, seldom suffering more than is usual on a change of climate.

There were only three exceptions I believe, viz. at St. George's and Richmond Hill, Grenada; once or twice at Fort Royal, Martinico; and once at Tortola. The appearance of the malignant pestilential fever at the Danish Islands, St. Croix and St. Thomas, may be considered as exceptions

exceptions also; but the infection was not immediately derived from any British colony. At Grenada a very singular distinction was exhibited between the malignant pestilential, and the yellow remittent fevers. The causes of the former had been cherished in the retailing rum-shops, and the haunts of low dissipation; and the state of warfare that unhappy island had been involved in by an insidious and cruel internal enemy, had suspended the exercise of police; had permitted irregularity, uncleanness, and the accumulation of infection, to exist; and had diverted the attention of the legislature from enacting such salutary laws and regulations, as might have proved destructive to the means of disseminating the evil. The troops which were latterly, and successfully employed in the restoration of the island to tranquillity, were all, or principally of Sir Ralph Abercromby's army. One part of these, the 27th regiment, were, after the campaign, stationed on Richmond Hill; another, the 57th regiment, at a distant post, Gouyave. These regiments were both healthy, and none of the men had been exposed to infection before the distribution of their quarters. Soon after they became stationary, the morbid causes peculiar to each place, began to exhibit their baneful influence: and the malignant pestilential fever at

St. George's, and in the adjoining fortresses, was not more destructive, than the yellow remittent at Gouyave, and at some of the out-posts. During the insurrection, a similar distinction was perceived to take place at Grenville Bay; for the troops occupying that post at different times, being exposed, under the most unfavourable circumstances to the miasmata of the extensive marshes which nearly enclose that unhealthy place, were seized with the diseases which are their peculiar production, and chiefly by the yellow remittent fever; and a great many suffered by it. It is singular, however, that although no doubt can be entertained of the diversity of the disease I have stated, a mode of treatment, almost in every respect the same, was found necessary in both: and some medical gentlemen impressed with the idea that one required bark and tonics, whilst the other yielded only to mercury and appropriate antiphlogistics, were the indirect cause of the great mortality which took place in the 57th regiment quartered at Gouyave.

The exceptions at Fort Royal, Martinico, were immediately after the establishment of quarters for the hurricane months in 1796, when several transports introduced the infection of the malignant pestilential fever. The consequences of this unwelcome visit I have related in another place.

Not being supported by new subjects to act on, it gradually disappeared, and gave place to the no less fatal endemic of the place, the yellow remittent fever, which, as usual, ceased towards the end of the year.

At St. Lucia, where a much greater mortality took place than any where else, the yellow remittent reigned alone, and with a degree of violence proportioned to the extent and to the malignity of the miasmata of the marshes, and the exhalations from humid and unventilated places, so generally met with in that island.

The medical staff of Sir Ralph Abercromby's army was principally composed of young men, who had little or no practice, and who were totally unacquainted with the climate, and its diseases; and of a few who had partially resided in the country, and who had had experience in the treatment of diseases incident to it, in the capacity of surgeons of regiments. Unhappily for the army, a diversity of opinion prevailed among these gentlemen; and whilst the former were strongly impressed with a belief that the universal epidemic was the malignant pestilential fever, the latter were determined to discredit the existence of any other epidemic, but the endemic yellow remittent of the climate. A prejudice either way at so important a period, became not men entrusted

entrusted with the charge of the sick of an army, the equipment of which had required, and had caused the expenditure of an immense treasure. The latter possessing much influence, by being placed in the higher stations of the hospital staff, their opinion diffused itself; and the former readily relinquished a belief which might militate against the professed views of the majority in becoming army physicians, viz. to secure a half-pay, by a short and imperfect service, under the fostering wing of which, they might obtain, in time, a comfortable establishment in private practice. Had not this conduct led to the pernicious, indolent, and unscientific habit of prescribing for the name of a disease; had it not prevented the investigation of the principles on which practice in any particular distemper should be founded; had it not tended to the discredit of a mode of treatment of the epidemic, from which alone success could be expected; had it not been, in short, the paramount cause of the mortality which has disgraced the annals of the West India medical staff of the day; it might be considered as a harmless display of the vanity of momentary power; and sink into the insignificance naturally and necessarily attached to it.

This confused, partial, and fluctuating opinion, has given rise to a want of discrimination in de-

scribing the two diseases. It has been either always the malignant pestilential fever, or always the yellow remittent of the country. With a view to remove this ambiguity, I shall here describe the yellow remittent bilious fever as it appeared among the royal artillery at Fort Royal, Martinico. If the gentlemen of the hospital staff of the line, who exercised the functions of their office during the war in the West Indies, but more especially during the fatal years 1796 and 1797, have observed circumstances which constitute exceptions, or establish features different from those I have given this destructive calamity, the candid communication of them will serve further to illustrate the important point, the only object I have in view.*

The

* I beg leave to request the attention of these gentlemen to the reflections of Zimmerman. "Nature being infinite in the combination, production, and variation of all her phænomena, the physician should study her attentively. He will attain much of this knowledge by reading and attending to the observations of others. *In order to make observations himself, it will be necessary for him to have some fixed principles to build upon; he will be capable of distinguishing diseases, only in proportion as he is previously acquainted with their history. Hence the utility and necessity of reading. The most interesting symptoms of a disease, are often so imperceptible, or are so transitory, that he who knows not something of them beforehand, from historical observations, will almost always fail to notice them.* The penetrating masterly eye, which is so useful at the bed-side of the sick, depends, indeed, very often, on genius. But no man will understand
any

The yellow remittent bilious fever has been ushered in, in various ways. Symptoms of dysentery have continued for two, three, or five days, and have suddenly been superseded by those of this fever : fainting fits have in several instances preceded the predominant symptoms of it. The attack has also been preceded by general febrile phænomena for a few days, before those distinguishing the yellow remittent have appeared. The fever has much more frequently, however,

any thing of what he has not previously a true idea ; nor will he reap any advantage from what he sees, unless he is aware of the tendency of nature on the occasion. Without this knowledge, the principal disease is sometimes mistaken for a single symptom, or a symptom for the disease itself ; and, *in acute diseases, the patient is almost in the grave, before any regular method of cure has been adopted, and the practitioner, so far from being able prudently to assist or foresee the wants of nature, is unable even to follow her.* On such occasions, we ought not only to be able to say, from our knowledge of the animal œconomy, what may be expected to result from such and such a determination, in certain circumstances ; but we ought, likewise, to have seen, in the observations of others, in what way nature terminated similar diseases, and with what success art attempted to imitate, or assist her operations in such cases. The true physician is seldom known, but in extraordinary cases ; the ordinary practitioner, who trudges on in an old beaten track, seems superior to the man of real learning, *so long as he continues within his circle, but the moment a new and singular disease occurs, the mask drops, and the popular practitioner is at once confounded with the vulgar.* “ Λεγε πρατικως, και πρατε λογικως. Reason as a practitioner, and practice with reason.” Experience in Physic, B. ii. Ch. iii. Eng. Translation.

assumed the type of a quotidian or double tertian ; but the distinguishing symptoms have not often made their attack suddenly.

The yellow remittent fever has always, as I have already observed, made its appearance in the vicinity of marshes. It has also been very prevalent in the neighbourhood of ponds of stagnant water, and more especially when their surface has been agitated by slight showers of rain, succeeded by considerable heat. It has also been observed to take place in situations subject to considerable humidity, but never exposed to the influence of the sun, or the dissipating action of winds. But in situations differently circumstanced, no instance of the invasion of the yellow remittent fever, I believe, is on record, or has been observed.

In whatever manner, or in whatever situations, the yellow remittent fever approaches, its symptoms and progress are uniform ; and more or less rapid and violent, according to the circumstances of temperament, assimilation to climate, and the activity and power of the predisposing or exciting causes. When the fever is formed, it is characterised by a violent pain extending to every part of the head : pains in the lower extremities, stretching the whole length of the thighs and legs ; and although felt severely at the calves,
never

never confined exclusively to that part : pains in the lumbar region, frequently of a violence exciting inconceivable torture : an oppression at the serobiculus cordis, attended with great anxiety ; and frequently a sense of fullness, distention, and obtuse pain in the right hypochondre. It is also distinguished by an uncommon redness and flushing of the face ; by such a turgidity of the blood-vessels of the eyes, as gives them a very highly inflamed appearance, and produces very uneasy sensations on the admission of light : and by a singular expression of countenance, which conveys the idea of incipient alienation of mind. The heat of the surface, and the state of the pulse, are, in a great measure, regulated by the exacerbations and remissions, the periods of which are not, however, by any means, certain and fixed. During the former, the surface feels excessively hot, dry, and parched ; and the pulse, generally full and rebounding, varying from 100 to 130 strokes in the minute : in the latter, the surface is restored to nearly its natural temperature, and the skin acquires some degree of softness and moisture ; the pulse also becomes considerably slower. It is singular, however, that as the disease advances towards a fatal termination, more especially, the heat of surface during the exacerbation becomes pungent, and leaves a most un-

pleasant sensation on the fingers after the touch ; and the pulse, with its former quickness, is also feeble, tremulous, and intermittent. During the remission, instead of the natural temperature, the skin acquires a most unpleasant coldness, and feels as if bathed in a clammy fluid, whilst great internal heat is remarkably perceptible at the præcordia. The exacerbations and remissions are then, too, more frequent, less distinct, and, the former particularly, of shorter duration ; that is, the vital powers lose so much of their energy, as to produce but feeble excitement ; and, nature, overpowered, is incapable of resisting the approaching dissolution of the system. Notwithstanding this state of the body, hæmorrhage is rather an uncommon phænomenon in yellow remittent fever ; and, instead of vibices, and blotches resembling the suffusion after a severe blow, the whole surface acquires a deep-yellow colour ; and numerous petechial eruptions are thrown out. The period at which this discoloration of the surface happens, determines, with wonderful precision, the future event ; if this takes place on the 2d, 3d, 4th, or 5th day, the most fatal prognostic may be founded on it ; if, on the contrary, it does not appear till the 7th, the apprehensions of a fatal termination is very considerably lessened, or may be altogether removed.

Thirst .

Thirst and absence of constipation may be justly considered as distinguishing symptoms ; no period, except, perhaps, towards the close of life, being exempt from the former ; and the body being open at all times, unless restrained by medicine. In fact, diarrhœa is frequently a most dangerous circumstance of this fever, and often prevents a sufficient retention of the only remedy which has been found adequate to arrest the progress of the disease. The exacerbations, I have said, in the advanced state of the disease, when no favourable change has as yet been discovered, are more frequent, but of shorter duration : they are then, too, divested of those pains which distinguish the preceding periods, and are marked with wild, sometimes, furious delirium, and exertions of what has been happily called, morbid strength. The balls of the eyes, which were hitherto red and inflamed, now assume a very different aspect ; an exudation of coagulable lymph giving them the appearance, in many instances, of one uniform gelatinous mass of a greyish colour. But the irritability of the iris seems at no period of the yellow remittent fever to be suspended, having never observed permanent dilatation of the pupils. The remissions in the advanced state, already described, are further distinguished by coma, sighing, a flowing of tears, faintings, subfultus tendinum,

tendinum, hiccup: but during this state, when the powers of life seem thus prostrate, the voice does not appear to undergo a similar change, being strong, full, and as sonorous as in health. The vomiting, which is one of the most alarming and dangerous of the phænomena of yellow remittent fever, although not peculiar to it, is sometimes concomitant with the accession of the first exacerbation, and increases as the fever proceeds: but, in general, although in almost every instance, there is a certain degree of nausea present from the very beginning, yet vomiting does not come on, and become a dangerous symptom till about the third day. From that period, unless signs of a favourable change arise, it becomes every instant more urgent, and at length, is accompanied with what has been improperly considered as diagnostic of yellow remittent fever, a discharge of a black or brownish coloured fluid, of the consistence of coffee grounds. Before the black-vomiting comes on, the discharged fluid is always bilious, and has the bitter taste, and the yellow or greenish colour of bile. From the excessive pain at the stomach, which accompanies the vomiting, it is presumable that an inflammatory state of that organ, terminating in rupture of the more minute blood-vessels, and in gangrene, is the principal cause of the symptom, and
gives

gives the dark colour to the fluid discharged. In the progress of the disease, the tongue, fauces, and gums, undergo morbid changes; but undistinguished by any peculiarity. A suppression of urine, attended with pain above the pubes, almost always happens late in the disease; but no uncommon morbid change in the state of the bladder, or kidneys has been remarked on dissection. The urine, as well as the perspired fluid, are deeply tinged with a yellow colour. Death takes place in this fever, without violent or convulsive agitations of the body; and at that awful crisis, there is more frequently a placidity of countenance, and a tranquillity resembling sleep, in which the patient expires: a termination the more singular, as the preceding periods exhibit an uncommon anxiety and perturbation of mind..

These are the great features of the yellow remittent fever, so formidable in its attack, and, unhappily, so fatal in its event to all European or other strangers to the climate. But this, though generally ascribed to the West India climate, and even distinguished by a name importing the country in which it is supposed to originate, is by no means, thus confined. The action on the human body of the miasmata of marshes, and of the exhalations from humid and unventilated places, of that poison, that “*cæcis terroribus*
aura,”

aura," the nature of which is still to be discovered, aided by the predisposition of the subject, and the heat of the season or climate, must be every where the same, where marshes, stagnant water, and humid unventilated places are found. Some modification, doubtless, may arise from local circumstances, but the disease must be essentially the same; and the testimony of every medical observer, in such situations, serves more fully to confirm the opinion. It is the endemic of the marshy tracts of Asia, and more especially of India: it is also the prevalent fever in many similar tracts of Africa; and instances of its frequent existence in the southern parts of Europe, and even in the central and northern parts, where the predisposing causes have been powerful, and the temperament plethoric and sanguineous, are on record.

CHAPTER VIII.

What is the Nature of the Remote Cause of the Malignant Pestilential, and of the Yellow Remittent Bilious Fevers ?

I HAD no intention to enter into a theoretical discussion of the nature of contagion, or of that fluid to which malignant and pestilential fevers, and the plague, owe their origin : nor to attempt the establishment of a distinction between that and the essence of those miasmata and exhalations, the cause to which intermittent, remittent, and anomalous fevers are assigned. But a late very ingenious enquiry into this mysterious subject, having thrown much light on it, or at least divested it in a very considerable degree, of the obscurity in which it has been hitherto enveloped, I have been induced to examine how far the theory is applicable to the diseases in question ; and how far the phenomena they exhibit can be explained on the principles on which it is founded.

A discussion on this hitherto obscure point, the specific nature of contagion, or pestilential effluvia,

fluvia, in able hands, must afford ample field for speculation, and open a subject of very curious enquiry. But it has been very justly observed, that “ various theories proposed on this subject derive much from ingenious fancy, but very little from direct experiment; or general conclusions have been too hastily drawn from a few experiments, and analogical reasoning has been much too freely indulged.” And we are also told, that “ the properties of contagion are only to be collected from their visible effects; so far as these are ascertained, no further, our knowledge can be said to extend.”* The revolution, however, which has taken place in chemistry, and the astonishing discoveries which it has led to, since Dr. Ruffel published his valuable work, may account for an opinion, which the state of medico-chemical knowledge prior to this new æra, fully justified.

The utility of establishing distinctions between the principles of contagion, or infectious and pestilential effluvia, and those of marshy and humid exhalations, in general, must be sufficiently obvious to the most common understanding; but the possession of a clear and distinct idea of the precise nature of the former, must, in an espe-

* Ruffel on the Plague, B. iii. Ch. vii.

cial manner, serve many useful purposes : for, besides gratifying speculation, it necessarily points out the remedies peculiarly adapted to the malady which they gave rise to ; and renders perspicuous the means of prevention which should be pursued. It is a melancholy truth, that the loose and undeterminate notions which physicians have entertained of the nature of contagion, or rather of the causes of diseases which are communicable by one person to another, or by those things which were in contact or imbued with effluvia exhaled from infected bodies, or in any other way contaminated by the sick, have led to the adoption, neither of suitable medical treatment, nor of means of certain prevention. A confused and contradictory plan of cure has in an especial manner been the consequence. Dismay, astonishment, and despair, have uniformly reared their terrific heads, on the appearance of a malignant and pestilential epidemic ; and innumerable have been the sacrifices to the chaotic and unscientific practice of physicians ; to the prejudice of ignorance, or the precepts of superstition.

Sydenham long ago was not ashamed to confess his ignorance of the specific nature of contagion : *quod ad morbi essentiam spectat, eam enucleate definire in me non suscipio*.* By other

* Feb. Pest. and Pest. Arin. 1665 and 1666.

physicians less ingenuous,^x we are told that “some matter floating in the atmosphere, and applied to the bodies of men, ought to be considered as the remote cause of fevers: and that these matters present in the atmosphere, and thus acting upon men, may be considered either as contagious, that is, effluvia arising directly or originally from the body of a man under a particular disease, and exciting the same kind of disease in the body of the person to whom they are applied; or miasmata, that is, effluvia arising from other substances than the bodies of men, producing a disease in the person to whom they are applied.”^x It is afterwards said, that human and marsh effluvia are of a debilitating or sedative nature; and that, as putrid matter is always, with respect to animal bodies, a powerful sedative, so it can hardly be doubted, that they are both of the same quality; yet a little before he informs us that the particular nature of marsh miasma is unknown.* Again, it has been stated to us that “the specific nature and qualities of contagions differ from each other, and are, in many respects, inscrutable. How far does each extend its proper sphere of activity?” Who can explain why the small-pox will infect persons but once during their lives; while the

* Cullen's First Lines. P. i. B. i. C. 4.†

x. What is there in this quotation from Dr. Cullen, plague that can warrant the author's charge of disingenuousness?

plague and other infections attack again and again? There are unquestionably certain limits prescribed to human researches, beyond which, though fancy may take its flight, and theory make wide excursions, all is conjecture, obscurity, or profound darkness.* Sir John Pringle seems to have possessed a more determinate and correct idea of the matter, when he observes, that although pestilential fevers are various, *all seem to depend upon some internal or external fomes of corruption, whether owing to a putrid habit, or to exhalations from corrupted animal or vegetable substances.*† And when he afterwards remarks, that “the putrefaction of animal or vegetable substances, in a dry air, is most apt to produce a bad fever of a more continued form; whereas putrid effluvia, in a moist atmosphere, have a greater tendency to bring on paroxysms and remissions,† a clearer distinction is laid down than I have met with in any writer; and the existence is pointed out of a something peculiar in the latter species of miasmata, which probably gives rise to the difference of phænomena in remittent fevers. Thus little satisfactory on this curious and important subject has been produced by those en-

* Lind on Infection, chap. ii. sect. v. p. 295.

† Diseases of the Army, p. 3. chap. vii. sect. vi.

†. Either the author's judgement or his candour must be called in question here. What is there in this quotation from Pringle, that is not more fully & clearly expressed in that from Cullen? 2

gaged in the speculative pursuit: But however undetermined physicians have been with respect to the precise nature of the causes of fevers, they have almost uniformly, from the days of Hippocrates to the present, attributed them to animal or vegetable putrefaction. Further, scarce any have ventured with any degree of success.

The enlarged views we now possess of the composition of bodies, have, at length, enabled ingenious and scientific men, to trace the causes of diseases, more especially of fevers, to various combinations of the gaseous productions of animal and vegetable substances in a putrescent state: but although able chemists of the old and new continents have thrown much light on the obscure subject, much still remains to be done before a theory, founded on chymical combinations well ascertained, and applicable to all the circumstances of disease, can be established.

The discovery of the composition of the atmosphere, and of the precise nature of the fluids constituting it; the accurate analysis, which has been made, of the compounds of animal and vegetable substances in general; and of water; and the knowledge acquired of the attractive powers of certain fluids, forming the bases of these compounds, to each other; and of the repulsion they exhibit to others; have opened views wonderfully

fully extensive, and have given energy, as well as latitude, to the researches of ingenious chemists. Among these Dr. Mitchell of New York, in the present instance, claims a pre-eminent rank. This gentleman has deduced a theory of the nature of the cause of disease, but more especially of those fevers which are communicable from a diseased to a healthy person, from the principles I have mentioned; which being applicable to, and illustrated by, several of the phenomena of these diseases themselves, and the sources from which they are obviously derived, as well as the treatment to which they most readily yield, bids fair for a permanent establishment.

If the atmosphere is universally found to be composed of two principles, however varied the countries may be, to which it is superincumbent: if animal and vegetable bodies are invariably possessed of certain principles, which, on dissolution and putrefaction, are capable of being exhaled in a gaseous form; if the salubrity of the former, and the healthy constitution of the latter, necessarily depend on a determinate mixture of these principles, without their entering into a chymical combination; does it not follow that an excess of any one principle, or a new combination of any two of them, inconsistent with the salubrity of the atmosphere, or the healthy constitution of

the animal or vegetable, however produced, must be the cause of that derangement known by the word disorder, and distinguished by the mode of morbid action, excited. So obvious a conclusion precludes the necessity of argument for its support. The various deviations from the proportions of oxygen and azote, which fix the standard of health; or their approaches to a chymical combination by the abstraction of the matter of heat; give rise to the various characters of disease; and as that principle which is most destructive of life, in an active state, azote predominates, so will the malignity of the morbid action excited by it.* This principle is capable of

* This is explained in the following manner, in a very ingenious thesis written by one of Dr. Mitchell's pupils, who has given the sentiments of his preceptor in a more dilated form. "The atmosphere is composed of 73 parts of septous (azotic) gas, and 27 of oxygenous; but these are mixed together mechanically, just as wheat and rye are distributed in a heap of grain, or as sand and shells lie dispersed along the sea-shore." The particles of each are fully mingled with those of the other; but, during all this intercourse, both septon (azote) and oxygen retain their attraction for caloric in full force; and while this continues to be the case, no union takes place between the *putrifying* and *acidifying* principle, as, in common circumstances, both possess a stronger attraction for the matter of heat than for each other. The proportions stated seem to be about the mean ratio; and the reason of their not more frequently combining and spoiling the respirability of the atmosphere, is, that when once they assume the form of gas, they have less affinity to each other than to the fire, which gives them permanent elasticity.

of combining with the principle of acidity, as well as the matter of heat, in four distinct proportions, and constituting in an inverse ratio of oxygenation,

elasticity. The requisite to their chymical union then is, the *abstraction of their caloric*. Hence the difference between the *contagious fluid* (the gaseous oxyd of azote or septon, consisting of 63 parts of septon or azote, united with 37 parts of oxygen) and *atmospheric air*, will be apparent; the one being a *chymical connection*, whereby both the ingredients lose their separate qualities; while the other is a *mere distribution, or dispersion of the particles of each among those of the other*, possessing still their discriminating qualities, and totally free from any combination with each other; the former brought about by reason of the near approximation or stronger attraction of the ingredients in the decaying body, before they combine with caloric enough to turn them to gases; while, in the latter, such is the cohesive power by which septon (azote) and oxygene, when once as gases, united to caloric, stick to it, that the weaker attraction they have for each other cannot, in ordinary circumstances, overcome it; and thus, in the same temperature, the elements may form septous (azotic) oxyd, or not, according to their respective relations to other elements at the time, and the strength of alliance by which they are bound to them. If the quantity of oxygene is greater in the oxyd than in the atmosphere, it is not more surprizing than in the example of arsenic, quicksilver, antimony, sulphur, phosphorus, and charcoal, acquiring great change of qualities, and becoming vastly more active by being charged with a sufficient dose of oxygene; for, like several of the enumerated substances, septon (azote) is both an *oxydable* and an *acidifyable* base. That such a precise proportion of the base of vital air should be necessary to convert septon (azote) into an active poison, is not hard to comprehend, since, without it, septon (azote) is little better than a poison; it possesses no salubrious properties, and, at best, deserves but the negative character of not being mischievous." An Inaugural Dissertation on the Chemical and Medical History of Septon, Azote, or Nitrogene, &c. by W. Saltonstall, p. 16.

oxygenation, nitric acid, nitrous acid, nitrous gas, and the gaseous oxyd of azote or nitrogene. The nitric acid, the highest degree of the oxygenation of azote, contains $79\frac{1}{2}$ parts of oxygene, and $20\frac{1}{2}$ of nitrogene ; the second degree of oxygenation of azote, I believe, has not been sufficiently ascertained ; the third contains 68 parts of oxygene, and 32 of nitrogene ; and the lowest contains only 37 parts of oxygene, and 63 of nitrogene.* The last combination of the principle with vital air, constitutes, Dr. Mitchell informs us, the basis of contagion, and that of the deleterious fluid exhaled from marshes and stagnant water. The chymical character he gives of it, is the following. “ In the gaseous oxyd, produced by the union of the two atmospheric ingredients, the portion of the acidifying principle combined

Dr. Armstrong seems to have had a just idea of the nature of this oxyd, when he thus expressed himself :

——— It is not air
That from a thousand lungs reeks back to thine,
Sated with exhalations rank and fell,
The spoil of dunghills, and the putrid thaw
Of Nature, when from shape and texture she
Relapses into fighting elements ;
It is not air, but floats a nauseous mass
Of all obscene, corrupt, offensive, things, &c.

Art of Preserving Health, book i. p. 71.

* See Chaptal, vol. i. 230, &c. and Remarks on the Gaseous Oxyd of Azote, or of Nitrogene, &c. by S. L. Mitchell, &c. &c.

with

with its nitrogene base, is too small to manifest a sensible degree of acidity; not even so much as to have any effect wrought upon it by exposure to liquid caustic alkali, nor muriated tin; and in its pure state undergoes no shrinking, decomposition, or change, by mixture with the atmospheric fluid, nitrous gas, or vital air." In relation to the human body "in ordinary breathing, the gaseous oxyd does not only not yield its principle of acidity to the blood in the pulmonic circulation, but at the same time does not sufficiently attract carbone from the venous portion of it; whence it comes to pass, that an animal inhaling an air, contributing to neither of these salutary processes, must speedily die; its blood being both in a disoxygenated and super-carbonated state; hydrogen alone being the ingredient in phlogistic operations which readily attracts its oxygen from the gaseous oxyd. This singular aëri-form product besides being artificially obtained, is also generated by a natural operation in the decay of organized bodies, containing both nitrogene and oxygen, when a certain temperature of the weather favours its production. This temperature in the external air, may be any degree between 75 and 85 of Farenheit's scale; but within doors it may be generated in the coldest part of winter. It may be also produced from

similar substances long retained in the alimentary canal of living human bodies. As this oxyd may be generated during the putrefactive process of animal and vegetable substances externally; and may arise from the excrementitious part of the aliment too long retained in the human body internally; so, consequently, it may be applied as a cause of disease, in a variety of ways. It is, therefore, carefully to be considered, that according to the nature and function of the organ on which the gaseous oxyd exercises its virulence, will there be a variety in the morbid symptoms, though produced by the same cause. If, for instance, the stomach and the intestines are the seat of the gaseous residence, inflammatory symptoms of those parts, with tension of the præcordia, dryness and redness of the fauces, great heat and high pulse may be expected to supervene; whereas, if the lungs are pervaded by it, the heat will be moderate, the countenance pale, purple, or yellowish, the pulse slow, and the first passages more quiet; while the most violent disease must ensue, when both the lungs and intestines are exposed to its virulence."

This pernicious fluid is not only capable of exciting morbid action in human bodies placed near to where it is generated; but may be transported from one place to another. The ingenious

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ous professor on this part of his subject, thus explains himself. “ It was clear to me from the little disposition the gaseous oxyd possesses to combine with other bodies, and from its considerable weight (rather heavier than atmospheric air), that it might be transported from place to place, in tight boxes, or packages of goods, &c. and that on opening these, and taking out their contents, the unchanged gas might be inspired into the lungs, or insinuate itself into the stomachs of such persons as should be exposed to it. This inference from the principle is also conformable to fact; for upon it depend the instantaneous deaths in some cases; transported infection in others; and fevers kindled up in others, from the subtile matter exhaling from such fomes. Besides, if from the heaviness of the oxyd, it always has a tendency to the lower parts, then ships, through whose sides it cannot leak out by reason of their tightness, should be very apt to accumulate it; and this too corresponds with the fact; sea-vessels being among the chief agents in its production and diffusion, the receptacles of its collected virulence, and the seats of its most destructive ravages.”

The application of these considerations to the phænomena of contagious diseases, leads Dr. Mitchell to a general conclusion, that the gaseous
oxyd

oxyd of azote or nitrogene, is the basis of that poison called contagion. The reception of this principle as the cause of those fevers which are called continued; and of the malignant and pestilential more especially, affords a most rational explanation of the signs of morbid action which characterise them, and gives a more distinct and satisfactory view of the means of preventing them, than any hitherto suggested: the former appear as necessary consequences of the admission into, or the generation of, this pernicious gaseous oxyd, in the body; and their nature consequently becomes as obvious, as their various features are easily accounted for. I forbear entering more minutely into the applicability of this cause to the production of the phænomena of contagious diseases, the ingenious author of the theory having done it in a most masterly manner; and I wish not to anticipate the pleasure the reader must enjoy in the perusal of his excellent work. I shall, therefore, only observe in general, that the nature of the symptoms, the mode of operation of the remedies found to possess the most efficacy in, and the means of prevention of, all diseases depending upon the action of general or pestilential contagion, seem no longer mysterious, or concealed from us.

So far as contagion or infection, or both,* are concerned in the production of fever, the foregoing doctrine is perfectly applicable, and rational. Dr. Mitchell is inclined, however, to think that the same doctrine is equally applicable to fevers proceeding from the miasmata of marshes, and stagnant water: but here a difficulty naturally arises, which cannot readily be removed by the principles on which the generation of the gaseous oxyd of azote takes place. Marshes abound in putrid vegetables, and possess little of animal matter; at any rate, the proportion of the former to the latter is so very great, as to leave little room to believe that azote is predominant in the miasm or gas which exhales from them. To obviate this difficulty, besides the azote which is very plentiful in some vegetables, it is supposed, that the insects and small animals, which annually perish in marshes, yield, in their putrefactive process, a product, which, in combination with that of vegetable substances, produces the gaseous oxyd of nitrogene.† But however ingenious the idea may be, it is not in every respect applicable to the phænomena of

* See Ruffel on the Plague, p. 203.

† See Mr. Saltonstall's Thesis, p. 22, and the many valuable and ingenious papers of Dr. Mitchell, published in the 1st and 2d vol. of the New York Medical Repository.

fevers produced by marsh miasmata ; nor does it by any means discover to us the cause of the absence of contagion in them. Were, indeed, the cause of all fevers uniformly the same, a resemblance of phænomena no doubt would be manifested ; as well as a similar power in the effluvia emanating from the persons of those labouring under fever, to excite an action of the same morbid nature in the persons of those exposed to them. I am aware that some eminent physicians maintain that all fevers are contagious ; and were this the case, the gaseous oxyd, doubtless, might be admitted as an universal agent in their production. But there are well-grounded reasons for believing that those who maintain the universality of contagion, labour under a mistake : and it is infinitely more probable in certain instances, adduced as proofs of the existence of contagion in fevers supposed to have arisen from marsh miasmata, that the putrid effluvia generated on ship-board, had a much larger share in their production : or that they considerably contributed to change the type and nature of the original fever, by superseding the action of marsh miasmata, and introducing their own, being the most powerful principle of the two. Without entering into any speculative discussion on this point, I may observe, that the contradictory reports

ports of two medical gentlemen of observation and experience, on the history of the same fever, present us with a tolerably fair testimony of the probability at least of what I have advanced. Dr. Clark, whose observations on the diseases of hot climates are very valuable, says, that “ this contagious power in fevers, they possess in very different degrees, according to the different modifications of their remote causes. Thus regular intermittents, which derive their origin from the purer marshy exhalations, are only slightly contagious, whereas remittents, originating from corrupted exhalations after hot summers, or in warm climates, are very contagious; and from this cause often assume a continued form: and when this happens, these remittents differ in no respect from that variety of continued fever, which is propagated in camps, jails, hospitals, ships, and in the confined habitations of the poor.” And afterwards, enumerating the remote causes of the remittent fever of Bengal, he more explicitly informs us, that “ contagion was very evident in the fever of Bengal; nor was the fever less infectious at Calcutta, where the patients lay in large rooms.”* How different is the informa-

* Observations on the Diseases which prevail in long Voyages to Hot Climates, particularly in those in the East Indies, &c. vol. i. p. 153 and 166.

tion we receive on the same subject from Dr. Wade. "A long voyage to India, and a long residence in Bengal, quieted the writer's apprehensions, and shook his faith on this subject (contagion). During the whole course of an assiduous practice there, he had not observed, to the perfect conviction of his own judgment, either in or out of hospitals, a single instance of contagion." He afterwards enters into an explanation of his general position, which appears to be abundantly satisfactory.*

With respect to the general principle on which the theory of Dr. Mitchell is founded, the experience of almost all the West India physicians, brings forward a formidable exception, at least, to its universal application. The yellow remittent fever is almost universally allowed not to be contagious; and as it exhibits a type very different from continued malignant and pestilential fevers in general, so, it is presumable, it must arise from an effluvia whose basis is of a nature essentially different from the gaseous oxyd of azote or nitrogene. But if the yellow remittent fever does not proceed from this cause; or, in other words, if the basis of the miasmata of marshes,

* A Paper on the Prevention and Treatment of the Disorders of Seamen and Soldiers in Bengal, p. 3.

and the exhalations from stagnant water, woody uncultivated grounds, and humid unventilated places in general, is not the combination of nitrogene with oxygene, to which Dr. Mitchell is inclined to attribute all fevers, whatever their type may be, or whether they are capable of propagating themselves by contagion or not; what is the basis of those effluvia so pregnant with the most pernicious consequences when applied to the persons of men in hot climates especially? I candidly confess myself totally unequal to the solution of the question.

The consideration of the composition of marshes, and of the surfaces of humid, woody, and unventilated places, direct us to a conclusion very different, perhaps, from that which Dr. Mitchell, and his pupil Mr. Saltonstall, draw from it. We are as yet to learn that azotic gas constitutes a part of their emanations; * at least in a proportion sufficiently large to give it a predominance; for as water and vegetable matter comprise almost the whole compages of fenny tracts, and as no analysis has hitherto discovered any azote in the former, and only in a small portion of the latter,* it is reasonable to believe that none

* "Humid situations afford scarce any glutinous matter in the vegetables they produce." Chaptal Elements of Chemistry, vol. iii. p. 104. This is the part of vegetables most resembling in

its
 *. And if we are yet to learn this which is capable of being made the subject of chemical test, where have we learnt it with regard to the contagious effluvia arising from the bodies of persons labouring under fever? Who has collected human exhalations from persons labouring under

is exhaled from them. The plants in which azote is found, are not generally the natives of such places; and although gramineous plants abound, yet probably none of those yielding a septous exhalation, exist. A poet's fancy may give being to innumerable multitudes of animal inhabitants in swampy regions; may depict "the hoary fen, in putrid streams, emitting the living cloud of pestilence;" but can we seriously believe that their number is such as to fill the air with the effluvia they exhale in the process of the putrefaction of their bodies; or to characterize the fluid sent forth from the marshes in which they perish.[†] This would, indeed, be a tortuous application of reason and fact to the support of preconceived theory. It appears to me infinitely more rational to attribute the mischievous effects of marsh miasmata to the known basis of the compound from which they arise, viz. hydrogenous gas, and a combination of the hydrogenous gas and the carbonic acid. I admit the presumption of contending with Dr. Mitchell in a chemical point to which he seems to have applied so

its properties, animal substances, and has thence by some chemists been called the vegeto-animal substance. It is consequently from the putrefaction of this substance that the nitrogene of those vegetables which contain it, exhales. See Chaptal on the Vegetable Gluten, l. c.—Fourcroy Elements, &c. vol. iii. p. 171, &c.

*†. But just now the poet's fancy was adduced as much
proof (see p. 262)*

much of his attention. But perhaps I have entered into no contest, the Doctor himself having intimated something like doubt relative to the applicability of his theory to fevers proceeding from the miasmata of marshes.* Far, however, from being inclined to enter on a contest, where the inequality of ability is so conspicuous on my side, I only attempt the humble part of suggesting what may be a more probable agent in the widely extended production of the various types of marsh fever.†

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* What are we to infer from these lines ?

“ ——— The conflict o’er, behold on all sides round,
In neutral chains, the powers of mischief bound ;
To lie, unless a rescuing force appears,
In durance strict, ten thousand thousand years ;
Except where swamps, their reinforcements yield,
And light detachments skirmish o’er the field.”

See Medical Repository, vol. i. No. 2. Art. 7. where, elevated by the favourite theme, the Doctor has clothed his doctrine of Septon in verse, addressed to Dr. Beddoes.

† Dr. Hunter has already suggested the probability of this origin of remittent fever. “ The cause of the remittent fever, says he, is evidently the exhalations of wet and marshy ground, which may be considered as a poison to the human body. The examination of these exhalations is the first step in the enquiry. Simple moisture in the air is perfectly harmless, in so far certainly as relates to the remittent fever. Marshy ground is known to produce inflammable air, which is found to be fatal when breathed of a certain strength, but when mixed with common air, is not known to produce any mischief. Were inflammable air the cause

Besides the paucity of azotic gas in the exhalations from marshes, several concurrent circumstances seem to have a tendency to establish the probability of hydrogenous, or, if Dr. Mitchell likes the expression better, *phlogistous air*, being the basis of their poison, either in a pure, or in a combined state with carbonic acid. The principal of these are :

of fevers they would be common in mines, which is not the case. Though the cause of fevers is not found in the inflammable air, yet the offensive smell of marshes is in a great measure owing to it. This investigation must be extremely delicate, but considering the great progress that has lately been made in the examination of all kinds of air, or elastic vapour, it is not to be despaired of." On the Diseases of the Army in Jamaica, p. 184.

I perceive that some American writers wish to refer all fevers, particularly the "yellow fever of Philadelphia and New York," remittents and intermittents, to one common cause, hydrogen or hydrogenous gas, "very much accumulated or peculiarly combined." This Doctors Mitchell and Miller, of New York, are by no means inclined to admit, and combat the doctrine with their usual perspicuity and chemical knowledge. But when they endeavour to set aside the proposition of Dr. Davidge, of Baltimore, that marsh effluvia do not produce contagious diseases, I fear they permit their better judgment to be warped by preconceived theory, without the smallest allowance for the result of accurate observation and extensive experience. It is to be sincerely wished that these very ingenious gentlemen would put the last hand to a work they have so ably managed already, by dispassionately instituting a practical enquiry into this matter, and drawing no conclusions, but such as are obvious deductions from facts illustrated by well adapted chemical experiments. See Med. Rep. vol. ii p. 83, 87.

1st, The levity of hydrogenous gas. The weight of this air to that of common air, is as 84 to 1000 : azotic air, on the contrary, differs little from common air in this respect, being to it as 985 to 1000.

2d, The smell. The putrid odour perceived to proceed from swamps, and often compared to that which is emitted from a foul gun after the explosion of gun-powder, is so similar to hydrogenous gas artificially obtained, as to leave little doubt that the fluid arising from the former, is either pure hydrogenous gas, or that fluid combined with phosphorus, or holding sulphur in a state of solution.*

3d, The deleterious qualities hydrogenous gas has been found to possess, with relation to animals placed in it.

4th, The exhalations from marshes exhibit their peculiar morbid action on human bodies

* This seems to have been the opinion of M. Volta. After an examination of the principle on which he endeavours to account for the production of inflammable air, he observes, “ Après que tout l’air fixe et ensuite l’effluve putride se sont dissipé, il doit rester, et une grand portion du phlogistique qui n’a pas pu s’évaporer par ce qu’il se mêle difficilement avec l’eau et suffisamment d’acide pour former un nouveau composé de pur suffre aérien qui est notre air inflammable, &c.” Lettres sur l’Air inflammable des Marais. Lettre 3.

placed at a considerable distance from them, but so situated as to have them blown upon them.

5th, Elevation does not exempt such bodies, and so placed, from being morbidly affected by them.

6th, Can a theory which makes the basis of marsh miasma, a fluid heavier than the atmosphere itself, explain these circumstances?

7th, In low situations, but so circumstanced as to be exposed to the miasma of marshes, considerably distant, the hydrogen is probably rendered more deleterious, by its combination with carbonic acid, the superior weight of which to that of atmospheric air, preventing its ascent with the hydrogen.

8th, This may be the cause of effluvia arising from stagnant pools of water, and humid, unventilated places adjoining the habitations of men, being more destructive, by exciting more violent morbid action in the system, than those exhaling from marshes, which are generally more distant.

9th, Hence it has been uniformly observed, that the malignity of remittent and intermittent fevers has been in an inverse duplicate ratio of the distance from the marshes whose exhalations produce them.

10th, Hence too is the cause of the sudden
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and fatal effects observed to take place in the crews of boats employed in wooding and watering, or the gangs of the coopers or carpenters belonging to ships of war, incautiously landed and left to work in low marshy situations.

11th, The ridge of Morne Garnier, behind Fort George (Bourbon), immediately in the vicinity of the town of Fort Royal, Martinico, and elevated above it about 600 feet, is extremely subject to regular intermittents, particularly those of a simple tertian type; and convalescents are frequently attacked by them, or fall into dysenteries. The air and situation are, however, extremely pleasant, and to the unacquainted, have every mark of salubrity. But the exhalations from the Lamentin marshes, to which the ridge is exposed, lying directly to leeward of them, certainly act here; for the height and the distance, about two miles, render the hydrogen more diffused, and less combined with the carbonic acid, and consequently dispossess it of much of its activity and malignity. The site of the town and its neighbourhood, which is low, and which is, indeed, itself either marshy, or made ground, or incommoded with stagnant pools of water, is, on the contrary, extremely subject to remittent fevers, and, during the hot months, to the yellow remittent bilious fever in its most malignant

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form.

form. Fort Edward (Louis), built on a rocky peninsula, is equally subject to these dreadful maladies, from its vicinity to the marshy grounds every where surrounding Fort Royal, and from its trifling elevation (15 or 18 toises, or about 100 feet), above the surface of the sea, which prevents much diffusion or tenuity of the hydrogen, and leaves it in a combined state.

12th, The same phænomenon is observed at Tobago. Marshes fully two miles to windward of Scarborough, produce violent remittents in the lower tracts between them and the town; but on the hill, on which the fort stands, equally distant, and similarly situated, but considerably elevated, only intermittents and dysenteries are observed to take place.

13th, Facts exist which seem to prove the morbid efficiency of hydrocarbonate. To those on record I may add a singular instance I find in the Medical Journal of the Ordnance Hospital at Fort Royal, at that time under the immediate charge of my ingenious friend, Dr. George Davidson. “ John Jackson at 21, fair complexion, admitted 30th January, 1798. The ordnance surgeon having employed Jackson in collecting the air from a pool of stagnant water, formerly used as a garden reservoir, the former was seized with a slight giddiness, which went soon off.

The

The latter was attacked with a fever which lasted for several weeks, attended with slight cough, pain in his breast, want of appetite, &c. Got an emetic which relieved him, &c. The air which was emitted from the bottom of the pool by stirring with a stick, deflagrated upon the approach of a torch, and appeared to be hydrogene in combination with carbonic gas.”

14th, Wine is principally composed of hydrogene and carbon. The aeriform fluid which arises from it during decomposition, must consequently be hydro-carbonic gas. Ships containing wine in a state of decomposition, are generally extremely sickly; and the character of the prevalent disease is that of the yellow remittent fever. Several instances of this took place in Fort Royal bay during the years 1797, and 1798; and their situation in the open bay, far from the influence of marsh effluvia, precluded a suspicion of the fever proceeding from that cause. The following instance is offered as an illustration of a remark I believe new or seldom made: The ship Nancy, Captain Needs, from Fayal, with a cargo of wine for the army, arrived at Fort Royal Bay, Martinico, in the month of October, 1798: she met with a gale of wind at sea on the 17th September; and several of her casks, from the motion of the ship, became leaky. The Captain

was actually taken sick at sea, and died with every symptom of the highest grade of yellow remittent fever. The mate and several of the crew were attacked with the same complaint: they recovered: but a mate, shipped at Fort Royal, fell ill on board and died. The ship lay out in the open bay, no vessel near her was sickly, and she herself became very healthy after the cargo was landed.

15th, The efficacy of the same remedy in the malignant pestilential fever, and in the yellow remittent bilious fever, does not seem to constitute any objection to the diversity of their remote causes: for the basis of putrid animal, and of marsh effluvia, when admitted into the human system, probably act in the same manner; and under varied phænomena, produce the same end. Or, if the curative operation of mercurial oxyds depend on the disengagement of oxygene from them, in the body, their efficacy in both fevers, will arise, in the first, by the destruction of the chemical combination of oxygene and nitrogene; and, in the second, by the greater affinity possessed by hydrogen to oxygene than to the carbonic acid, and by the consequent formation of an innocent fluid, water. We are still, however, too little acquainted with the animal œconomy, to speak with precision on the proximate cause
of

of fever; but as it is highly probable that the fluids constituting the remote causes, are powerful stimuli, and produce morbid changes, by exciting an inflammatory action, so must it follow that the admission of a power sufficient to counteract that action, will obviate the morbid changes, whether they assume the symptoms of the malignant pestilential, or the yellow remittent bilious fever.

Upon the whole, therefore, I am inclined to think that the remote causes of fever, are of two different kinds; each producing a class of fevers, whose character depends on the nature of the peculiar fluid constituting the basis of the morbid effluvia. Thus, then, the first set of the first class of causes, is the effluvia emanating directly from human bodies infected with contagious or pestilential diseases; or from substances to which the basis of these effluvia has attached itself: the second proceeds from human effluvia arising from healthy persons, but from the peculiarity of the circumstances in which they are placed, in a state of morbid concentration, and capable of generating a principle similar to that produced by infectious and pestilential effluvia: and the third is, the product of animal substances of every description, deprived of life, and in a state of putrefaction; which exhaling azote and oxygene chemically

cally combined, and diffusing through the atmosphere to a certain extent, the basis of pestilential infection, are equally capable of producing contagious and pestilential diseases. The second class of causes, comprehends the exhalations from marshes, stagnant water, and woody, humid, unventilated places, during a high temperature of the atmosphere; the basis of which is hydrogen, exciting fever in the form of intermittents; or hydrogen in combination with carbonic acid gas, exciting fever in the form of remittents. The first class are, therefore, reduced to one principle, the basis of morbid, concentrated or putrid animal effluvia, or the gaseous oxyd of azote or nitrogen. The second are reduced to two principles, the basis of marsh miasmata, and putrid exhalations divested of any mixture of animal putrid effluvia, in a more diffused state, hydrogen; or in a more concentrated and combined state, hydrocarbonate. Hence, wherever intermittents or remittents are perceived to be infectious, there it may be presumed, that the peculiar action of the basis of their cause has yielded to the more powerful action of the basis of the cause of infectious fevers, but that the system not having as yet accommodated itself to the form of the latter, retains much of that of the former; and on the other hand, wherever malignant and pestilential

fevers

fevers assume an intermittent or remittent form, there the action of the gaseous oxyd of azote has been wore out, and superseded by that of hydrogen or hydrocarbonate, and a consequent new morbid habit is gradually taking place.

Far, however, from attempting to decide in a matter so involved in difficulty and obscurity, I only offer what I have said on the subject, as a mere suggestion, arising from the combined result of speculative reasoning and practical observation, to be pursued by more able men. Should my conclusions be confuted on solid grounds, I shall have the gratification of having given rise to useful enquiry, and to the promulgation of important information.*

* How far the opinion of some eminent chemists, with respect to the composition of marsh miasmata, militate against that which I, with much diffidence propose, I shall not take upon me to say. The observations of M. Fourcroy should have always the weight which the ability and celebrity of their author gives: and I leave it to the judgment of the reader to reconcile the difference, or to adopt the opinion, which appears most consistent with the phenomena marsh effluvia are observed to give rise to. M. Volta, I believe, first remarked that the air proceeding from marshes, was inflammable: and with respect to its nature and cause, he observes, that “ Il est donc très-vraisemblable que cet air inflammable, doit son origine, non à la terre pure ou à toute substance fossile, et encore moins à l’eau, mais aux parties des végétaux macérées et corrompues, et peut-être même à des parties d’animaux; car j’ai trouvé dans la fange de certains étangs très abondans en air inflammable, des débris d’insectes en quantité, &c.” And to
distinguish

distinguish this from the inflammable air produced during the solution of metals in acids, he calls it “ l’Air inflammable natif des marais.” Letter 2. He afterwards, after a close and reiterated examination of the subject, attributes the inflammability of this air to its being saturated (*combiné étroitement et intimement*), with phlogistic air. Lettre 3. M. Fourcroy, Elements of Natural History and Chemistry, vol. iii. p. 431, informs us, that “ hydrogenous gas, mixed with azotic gas, forms that elastic fluid which M. Volta has denominated inflammable air of marshes. It is produced by the putrefaction of some vegetable matters, and of all animal substances.” He adds, “ in the years 1778, and 1779, I examined the inflammable gas of marshes, and discovered it to contain carbonic acid; but in several of these gases, found in different parts of the neighbourhood of Paris, I found a mixture the nature of which I did not properly distinguish, although I asserted, as may be seen in the 164th page of the Collection of my Memoirs in 8vo. that it is sometimes accompanied, or even has its place supplied, by phlogisticated gas, which, as I have elsewhere shewn, is the same with what we at present call azotic gas. These were merely vague assertions at the time when I inserted them in my Memoirs: but M. Bertholet has since communicated to them a degree of certainty and precision which induces me to distinguish this gas by the peculiar names above given to it.” It appears, however, from these passages, that the opinion of these celebrated chemists was formed from a very partial observation; and perhaps no general conclusion, with respect to the basis of the effluvia of marshes should be drawn from it.

I may here notice some curious and interesting observations given by Dr. Trotter, with respect to the decomposition of water at sea, and the means of preventing it, so as to keep it sweet and untainted. Water is now known to be composed of two fluids, oxygen and hydrogen, or vital and inflammable air. The gum-resin of the wood of casks has a chemical attraction to the oxygen, which leaves the hydrogen at liberty; and the hydrogen thus set free, gives the offensive smell and taste which *putrefied* or decomposed water at sea always possesses. To remedy this, he applied himself to discover the effect of the decomposition of water

on the staves of the cask. The Crown, 64, had arrived at that time from India, and had leagers on board during three years full of water, taken in at Spithead. These leagers were found to have their internal surface covered with a black scurf about $\frac{1}{8}$ of an inch thick, and exactly resembling charcoal. The water in these casks was extremely foul and fetid. It appeared, therefore, that the change or process was a kind of slow combustion carried on by the vital air of the fluid, which in time would convert the whole wood into charcoal. This was confirmed by experiment; and it clearly resulted, that well-firing casks, so as to char their interior surface, will effectually prevent the decomposition of water. Dr. Trotter draws this general conclusion from the premises. "The oxygene of the fluid joins itself gradually to a principle in the wood, till complete charcoal is formed. During this union, a proportion of these substances is so combined as to form carbonic acid, which is always found in some degree in tainted water. It is in this very manner that we must account for the same substance, called choak-damp, being generated in a ship's well or hold. Defending the wood from the water by charring, would effectually prevent the generation of the noxious effluvium." Medical and Chemical Essays, p. 147, 149. It is unnecessary to suggest the extension of this principle to swamps in general, the reader will readily perceive the facility with which the nature of their effluvia may, on it, be accounted for and detected.

CHAPTER IX.

What Constitution of the Air is necessary to give Activity to pestilential Infection.

THOSE who have wrote against the importation of the infection, or against the propagation of the fever of 1793, by contagion, contend, that a peculiar state or constitution of the air was the cause, losing themselves in a labyrinth of conjecture, from which they find no means of extricating themselves, but by this assertion. But even allowing this in the fullest application of it, what great point is gained? Every physician who has delivered his opinion of the origin of the plague, maintains that a peculiar state of the air is absolutely necessary to establish the powers of contagion, and give circulation to the imported infection: it is, therefore, conceding nothing in the present instance, to admit that at the time the infection of the malignant pestilential fever of 1793, was imported, something peculiar, and capable of predisposing the human body to be acted on by its poison, existed in the air; or that, in other words, the atmosphere possessed a peculiar

liar constitution. Without admitting this, we should find it as difficult to account for the cessation or disappearance of an infectious disease, as for the evolution of its cause. But has it been ever demonstrated on rational principles, that a peculiar constitution of the air or atmosphere of a country, has been alone, and uncombined, the remote cause of an epidemic disease, so extensive, so contagious, and so fatal, as that in question. If by a peculiar constitution of the air, is meant, such a deviation of its usual temperature, as leaves the heat or cold, which takes place, unpleasant or inconvenient; a question naturally arises, does the mere heat or cold of atmospheric air excite morbid changes in the human body, more especially such as characterise epidemic diseases? I am certainly inclined to think they do not, further than disposing or preparing it to be changed by the principles of the morbidic effluvia, whether they be animal or marshy. If we enquire into the circumstances of many of the situations in which the malignant pestilential fever appeared in 1793, we shall find, neither marshes, stagnant water, uncommon accumulations of filth, nor the concentration of human effluvia: it is therefore presumable, that the agent which produced the fever, did not proceed from them. But in such situations, where neither contamination

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of the atmosphere by great heat is probable, nor the existence of the sources of morbid animal or marsh effluvia ascertained, the adventitious importation of infection must necessarily be referred to. But let us extend our enquiry somewhat further.

If the long continuance of considerable heat, such as that which raises the mercury to a degree between 88 and 92; and if the absence of lightning and thunder, and of these storms which are considered as depuratory of the atmosphere, and which, by dissipating any obnoxious effluvia, or giving greater energy to such fluids as absorb or precipitate them, are supposed to possess any efficacy in restoring the atmosphere to a healthy constitution, are morbid remote causes of epidemics; how are they so? Do they operate by extricating morbid effluvia from their peculiar sources, and permitting their principle or basis to remain suspended and floating in the air; so as to give it, by accumulation, the opportunity of exciting a general morbid action in the persons of the inhabitants of the country or district, to which the atmosphere thus charged, is superincumbent? Or, in other words, producing an epidemic fever, the character and violence of which will be determined by circumstances? But the prevalence of so high a temperature, has always,
however,

however, been observed to deprive the morbid principle or basis of putrid animal effluvia of its virulence; and consequently to check, or altogether stop the progress of malignant and pestilential fevers. How far the absence of the depuratory influence of lightning, thunder, and storms, has efficacy in promoting the virulence of this principle, is uncertain. It may not, perhaps, check its power; but that it bestows greater energy on it, is, at least, doubtful; and I am inclined to think, should be rather considered as inadmissible. Yet that such a temperature, and such a tranquil state of the atmosphere, gave rise, exclusively, to the fever of 1793, is the opinion of some practitioners. Of these is Dr. Clark of Dominica. In another part of this work I shall endeavour to show, that the town of Roseau has been, for many years, totally exempt from the exhalations of marshes and stagnant waters; and that the opinion of the Doctor, relative to the decomposition of the atmosphere, is not founded on chemical principles. The consideration of these will, I presume, induce a belief nearly amounting to absolute conviction, that the fever, described by Dr. Clark, had not an endemic origin. It will consequently follow, that when he says “the want of these correctives, (thunder, heavy rains, and violent gales of wind)

as they may be termed, for impure air, left it in a state truly obnoxious to general health, which, I think was, most probably, the remote cause of this fever,"* he labours under a misconception of the true nature of the disease, and has formed his theory on wrong principles, or has allowed himself to be carried away by a strong prejudice, generally prevalent at that time, which denied the possible existence of infection and contagion within the tropics.

The observations of Dr. Patrick Russell on this subject, are valuable. After stating those causes which were generally believed to have checked the plague at Marseilles in the month of December, he informs us, that " a more powerful and general cause had begun long before to restrain the havoc of the pestilence, which had declined visibly in September, and in the course of the three subsequent months, decreased with a rapidity not ascribable to the exertions of the most vigorous police. This cause is generally supposed to be some change in the constitution of the air; but which hitherto has been defined with no better success, than that peculiar state of the atmosphere, which, in conjunction with contagion, is indispensibly necessary to render the plague

* A Treatise on the Yellow Fever, as it appeared at Dominica, p. 57.

epidemical. In what this particular constitution of the air consists, which in one case favours the spreading of the distemper, and in the other checks or extinguishes it ; whether it operates by heightening the powers of the infectious effluvia, or by inducing an epidemical change in the human body, whereby it is rendered more or less susceptible of, or enabled to resist their influence, the effluvia remaining the same, are points involved in much obscurity. It seems, in the meanwhile incontestible, that without a concurrent state of the air, the plague will not become epidemic ; and without a certain disposition of body, the infection will not take effect. “ Although the air be in a right state,” says Mead, “ yet a sick person may infect those that are very near him,” which is true, supposing them predisposed to receive the infection ; but, on the other hand, even in a corrupted state of the air, or rather that state, whatever it be, which favours the propagation of contagion, *some persons, from a peculiar unsusceptibility, are often known to approach the sick without being injured.* Were I to adopt one of several in this region of conjecture, I should be inclined, for the following reasons, to that which supposes the constitution of the air acting on human bodies, by heightening or lessening their susceptibility of contagion, rather than by height-

ening or abating the malignity of the pestilential effluvia. First, in the beginning of a pestilence, the disease, though less contagious, appears in its most fatal form. Secondly, in its increase and height, though manifestly more infectious, the malignity of the effluvia does not seem to be exacerbated, because milder forms of the disease are then more common. Thirdly, several persons infected from the same subject, are variously afflicted, some in a greater, some in a lesser degree, the disease being modified by difference in constitution. And, lastly, persons in constant communication with the sick, who have resisted infection in the most contagious stages of a pestilence, are sometimes attacked in its declining state; which seems to indicate some change in the habit of the individual, not the increased activity of the contagious effluvia.”*

From the known power which great heat, as well as great cold, possesses, to stop the progress of infectious diseases, particularly those of a pestilential nature, it is highly probable, that had the infectious matter attached to the bedding, clothes, &c. so carefully and pertinaciously preserved on board the *Hankey*, been imported in August, September, or October, the danger might have

* Treatise on the Plague, 4th edit. p. 260.

been prevented, by the destruction of its principle by heat. A comparison of the state of the atmosphere, at the period when the malignant pestilential fever ceased at Grenada, in 1793, with the tables given by Dr. Ruffel, shewing the increase and abatement of the plague at London, Aleppo, and Dantzick ;* and with the increase and decline of the plague at Marseilles ;† will, by demonstrating the influence which heat had in extinguishing altogether, or suspending the action of the contagion, present to us an unquestionable proof of the nature of that fever ; and of the probability of such an event. In the climates of London, Marseilles, and Dantzick, we find that the plague advanced rapidly in August, and raged through that month and September ; and that in London and Dantzick, gradually ; in Marseilles, it rapidly declined in the months of October, November, and December. A different constitution of the atmosphere prevailing at Aleppo and Grenada, we find that the virulence of the infection was greatest in June, whilst the temperature of the air was moderate ; and that it rapidly diminished in August, when the greatest heat existed. Dr. Ruffel states, that the plague had disappeared at Aleppo in the year 1760, about

* Treatise, p. 276, 277.

† Ibid, 254 and 263.

the 20th of August, at which time, the heat, indicated by the thermometer, as appears from the table in the Appendix, was, H. 96, L. 75, M. $85\frac{1}{2}$. The malignant pestilential fever of 1793, at Grenada, disappeared about the middle of September, when the heat was nearly similar, viz. H. 92, L. 80, M. 86. It appears that pretty nearly the same similarity holds with respect to the temperature of the season at which the plague appeared at Aleppo, and of that at which the malignant pestilential fever appeared at Grenada. At Aleppo it appeared in May, and became prevalent in June, 1760: at which time the heat, indicated by the thermometer, was, H. 80, L. 62, M. 71. The fever broke out at Grenada in March, and became prevalent in April, 1793; and the heat observed was, H. 87, L. 80, M. 83; so that there was a difference of no more than about 12 degrees. Perhaps, however, allowing for the difference of climates throughout the whole year, the one being almost uniform, the other subject to all the variety of season, experienced in the middle and southern parts of Europe, the effect of a degree of heat equal to 71, on the inhabitants of Aleppo in the month of March, may be as great as that of 83 on those of Grenada at the same season. The temperature of the atmosphere, on the re appearance of the plague at Aleppo,

Aleppo, in 1761, bears a closer resemblance to that on the same event at Grenada in 1794. The temperature of the atmosphere, at the subsequent periods of the disappearance and appearance of the malignant pestilential fever at Grenada, I am unacquainted with: but the sudden decrease of heat at Aleppo, and the plague continuing to prevail at the period when the former is generally greatest, and when the latter ceases, affords a strong evidence of the agency of heat in checking pestilential infection.*

Heat seems to operate on the infection of pestilence in a manner considerably different in climates subject to great heat in summer, and great cold in winter, as that of Philadelphia. The greatest heat during the year 1793, in that city, occurred on the 23d of July, viz. 91; the importation of the infection probably took place in that month; and the first cases of the pestilential fever were observed about the beginning of August. During the month of August the greatest heat

* The Reader may consult the Medical Repository of New York vol. i. p. 483, for the opinion of Dr. E. H. Smith, of that city, relative to the cause of the origin and decline of this fever at Grenada. It may be sufficient for me to observe, that, during the period of time from 1763, when the colony was ceded to Great Britain, till the year 1793, thirty years, no contagious fever, and no epidemic of the character of the malignant pestilential fever, appeared.

was 90, the L. 66, and the M. 78: in September the medium heat was exactly the same, although the greatest height of the thermometer was 89. It was, notwithstanding, during this month, that the fever raged with most violence, and proved most fatal. The medium heat of October was about 58, and of November 54, when the disease disappeared. Dr. Rush attributes the abatement of the fever to the rain which fell on the 15th October; but it is to be observed, that the rain of this memorable day was succeeded, for several nights afterwards, by cold and frost, one of the great agents in restraining, perhaps destroying, pestilential infection.* Thus, whilst
cold

* Account of the Remitting Yellow Bilious Fever, p. 131. Sydenham was well acquainted with the agency of cold in destroying the seeds of pestilence. “*Nascitur (peffis) eo quo diximus tempore, (viz. ea anni parte, quæ inter ver ac æstatem ambigit) crescente anno adolefcit, eodemque vergente collabefcit, donec tandem aërem in diathefin, huic morbo adverfantem, glacialis bruma tranfmutet.*” Quod si tempeftatum anni viciffitudines in hunc affectum nihil imperii exercent; verum feminium peffilentielle, nulla aëris mutatione domabile, de alio in alium, perpetua propagationes ferie, tranfmitteretur.” Chap. 2 feft. 2. In Mr. Carey’s publication there are some ftatements, the tendency of which is to invalidate the opinion of rain having checked the difeafe. They are judicious, and feem to be accurate, and certainly merit much confideration in an investigation of this nature. P. 64 The fame progress of the fever to its acmé in September, and to its decline and difappearance about the middle of October, was obferved, by Dr. Rush, in the Philadelphia fever of 1797; and the ice on the 12th and 13th of Oc-
tober

cold evidently checked the rage of pestilence at Philadelphia, the sudden increase of heat seemed to produce the same effect at Grenada.

I have observed a curious fact, which seems to constitute a further proof of a certain state or temperament of the atmosphere being necessary to dispose the human body to be more readily acted on by the poison of putrid animal effluvia. In situations which are themselves swampy, a humidity prevails in the air which gives rise to a cooler temperature, than others not so circumstanced possess. In such situations, the infection, of the malignant pestilential fever, has been observed to act with greater violence on the persons of men exposed to it, than where less moisture, and consequently heat, was generated. Fort Royal, Martinico, presented a remarkable instance of this in 1796. The medium heat of its atmosphere, during the twenty-four hours, is not

tober evidently "gave a sudden and complete check to the disease." *Med. Rep.* vol. ii. p. 188. It may be useful to consult the "Pestis Diagnosis," &c. of Dr. Antonius Cuneistrini, of Saltzburgh, for further information on this point. This physician observed, that the cold of winter does not always check the plague: on the contrary, excessive heat has extinguished, or, at least, diminished pestilential diseases. Besides the instance from Dr. Russel, quoted in the text, he says the plague of Oczakow of 1738 and 1739, declined in July, and ceased in September. It again appeared in February, and totally ceased in July. *Med. Review*, vol. iii. p. 261.

more

more than about 77 ; and during the pestilential season, if I may so call it, of 1796, the infection was uncommonly virulent, and required a much bolder exhibition of mercury to conquer it, than was found necessary at Grenada.

The action of heat on the poison which constitutes the cause of the yellow remittent fever, exhibits a series of events in every respect different. A moderate heat, and a season mild with respect to the general state of the weather, secure health to the inhabitants of tropical countries : great heats alternating with frequent showers of rain, constitute that state of the air which is most favourable to the production of yellow remittent fever. Why this should be so, becomes sufficiently obvious, from the consideration of the effects on marshes and stagnant water, which agitation, succeeded by great heat, must necessarily produce in them the extrication of a more abundant volume of the hydro-carbonic gas, or whatever ærial fluid constitutes the basis of the miasmata of such places.

CHAPTER X.

*What is the peculiar predispofition of Body neceffary to give activity to the Infection of the Malignant Peftilential Fever—the Time which the Contagion took to excite its Action—and the Dif-
tance at which it is poffible to communicate the
Contagion?*

HAVING, in the foregoing Chapters, difcuffed very fully the origin and progrefs, and the diagnostics, and having enquired into the peculiar nature of the malignant peftilential fever, and into that conftitution of the air which favours the propagation of its contagion; I propofe, in this chapter, to offer a few obfervations: 1ft, On thofe circumftances which feemed to predifpofe the perfons of thofe expofed to the infection to be more readily acted on by its poifon. 2d. On the time the contagion took to act on the fyftem. And 3d, On the diftance at which it was poffible to communicate it.

1. I have already obferved, that during what may be called the peftilential feafon at St.

George's,

George's, the contagious effluvia, more powerful than other morbid causes, reigned alone, having reduced all other diseases to its own peculiar nature. It is therefore highly probable, that, although the contagion seemed to vary much in different descriptions of persons, the virus of the contagion itself was uniformly the same, only variously modified by peculiar constitutions, habits, and modes of living. It is highly probable, too, that such as had the good fortune to escape the disease, although exposed to its contagion, were indebted to a peculiar temperament for their exemption. This exemption was enjoyed by few indeed, but its having existed at all can be accounted for on no other principle. On this principle can it be alone accounted for, that many who escaped the fever in 1793, were attacked in 1794; and that some, whose idiosyncrasy enabled them to resist the contagion in both these years, fell sacrifices to it in 1795. It is not, however, in the malignant pestilential fever alone that this singularity is observed: it has sometimes been remarked in other infectious fevers, and has frequently happened in the plague itself.* They, therefore, by no means contro-

* Lind on Fevers and Infection, p. 213.—Rusell on the Plague, p. 24, 65, &c. and also many of the cases, particularly 15th, 16th, 27th, 41st, &c.

vert the opinion I have formed of the fever of 1793 and 1794, who assert, that as many of those who attended the sick had not the disease communicated to them, the disease could not be contagious. All they establish by the assertion is, that those persons possessed a peculiar temperament which resisted the action of the contagion, or rendered it inert. As well might Dr. Ruffel have alleged that the plague did not exist at Aleppo, because a school-master, labouring under the disease, and placed in the midst of his scholars, did not communicate the infection to them: or with still greater propriety might the Doctor have made the assertion, when he perceived that the milk of an infected mother raised no commotion in the person of her infant child.*

A variety of predisposing causes existed, and were obvious; and the activity of the contagion, or the malignity of the disease, was proportional to the degree of predisposition. The extremes of predisposition, and inaptitude to be infected, were found in sailors and field negroes. Among

* The fact is remarkable. "The beginning of August (1760) a Rabbi, who kept a school for boys, was taken ill. I found him surrounded by above a dozen of his scholars, besides several women and children of the family, of all which none caught the infection except his wife, who fell ill eight days after him, and recovered. The man himself died the 6th of August." P. 24. The other fact, still more curious, is the subject of the 41st case.

the former, perhaps, a scorbutic taint, joined to extreme irregularity and imprudence, rendered the disease infinitely more fatal than among any other class of men: on the other hand, among the latter, who certainly possess an idiosyncrasy peculiar to themselves, and whose mode of living is generally temperate and regular in a remarkable degree, the virus of the contagion was so blunted, as to act in the mildest form. Why, however, it should operate with most violence on Europeans just arrived, and who had never entered the torrid zone before, is a singularity I do not pretend to explain. The advice of Celsus is very applicable in the present instance, and may furnish a hint with respect to the cause of this singularity. “ Si plenior aliquis et speciosior, et coloratior factus est, suspecta habere, sua bona debet.* Every thing debilitating predisposed

* Lib. ii. c. 2.—What are the circumstances of the constitution of the British, which so powerfully, and almost peculiarly, apate them to suffer by the effluvia of this contagion, or by the poison of the miasmata of marshes in hot climates?—The speciosior et coloratior factus est, seem to characterise the predisposition, and, probably, the nature of it. If predisposing and remote causes have a tendency to produce the same effect; in other words, if their nature is the same (Brown’s Elements of Medicine, § 80); we may say that the systems of the inhabitants of a cold climate, Great Britain for instance, from their peculiar modes of living, from the quantity of animal food which enters into their diet, *and,*
perhaps,

posed the body to be acted on by this contagion: fear; an hypochondriacal disposition; inebriation; fasting, or visiting the sick with an empty stomach;

perhaps, from the proportions of the constituent parts of their atmosphere, are less oxygenated than those of long residents, or natives of a hot climate; and that, consequently, on their arrival within the tropics, the disoxygenation of their blood, having superadded the septic oxyd of the infection, or the hydro-carbonate of marsh miasmata, the latter are rendered infinitely more destructive in their action. This appears to be much more than conjecture, from some experiments made, with a view to ascertain the quantity of oxygen in the atmosphere of the West India Islands, by which good grounds are given for believing that the proportion of that fluid, instead of being .27, which Lavoisier, and every chemist since his discovery, has fixed it at, in a cold climate, varies from .50 to .66. From the result of these experiments, which were conducted by Dr. Davidson, of Fort Royal, Martinico, precisely after the mode adopted by Dr. Mitchell, of New York, where the proportion of oxygen was ascertained to be .27; the causes of the hitherto unaccountable indemnity of Creoles, African and Creole negroes, and people of colour, with respect to the pestilential fever, and the higher grade of remittent fever, are apparent. Much additional light has been thrown on this difficult subject by the very ingenious author of "Medical Reports on the Effects of Water, &c." Dr. Currie and myself seem, indeed, to have possessed the same idea, when he made the following observations—and had he known, or added, that his second supposition is fully realized in the daily experience of every resident in the tropical climate, the coincidence of our opinions would have been complete on this subject. "The process of perspiration, which is continually going on from every part of the body, is the converse of respiration. A gas (oxygen) is constantly converted into a vapour (hydro-carbonate), and thus heat is absorbed. If then we suppose, that while the proportion of oxygen received into the system continues the same, the temperature

stomach; great fatigue; entering the chamber of the sick in full perspiration, &c.

2. But whatever were the predisposing causes, the

perature of the atmosphere is increased, we can understand why our heat is not increased, by supposing an increase of perspiration. *And if the temperature of the atmosphere remains unchanged, while the oxygen received by the lungs is increased, we can still explain the stability of our heat, by supposing an increase of perspiration.* The first of these suppositions is nearly realized, when a warm day comes on after cold weather; the second is realized when an increased respiration takes place under exercise. Thus perspiration seems to have a principal share in regulating the animal heat, and the chain of life seems connected with the physical world by two links, which the recent discoveries in chemistry enable us to unveil." P. 193—195. To Dr. Currie's third query, which he supposed a cautious reader may put, viz. "Is the perspiration of the skin more plentiful when oxygen is received in abundance into the system, than when it is imbibed more sparingly?" the discovery of the super-oxygenation of the atmosphere within the tropics, seems to furnish an affirmative answer. And if, as appears from Mr. Cruikshank's calculation, seven pounds weight is lost by the perspirative process in twenty-four hours, when at rest, in an atmosphere of 71 (l. c.); we may conclude, that from the same process in a tropical climate, where the atmospheric heat is sometimes more than 90, and generally 84 in the shade, and 120 in the sun, a loss must be sustained varying from $8\frac{1}{2}$ to $11\frac{1}{2}$ pounds in the same space of time. How can so great a loss be supported without supposing the proportional admission of oxygen into the system? and from whence can this large additional supply proceed, on the supposition that the body is at rest, but from the atmosphere? Hence much collateral stability to the result of the Eudeometric experiments already mentioned. Does not the same result also point out the desideratum in the following passage, which Dr. Clark, of Dominica, endeavours to supply from the commotion produced by a "warring of the elements?"

"By

the contagion always acted within four days from its application to the body. I am aware of the difficulty of ascertaining the time which contagion takes to act on the system after its admission into it; but my situation afforded me many opportunities of knowing it with sufficient exactness. In some instances, signs of its action have appeared in six hours; in others in twenty hours; in others in forty-eight; and in others not before the expiration of the fourth day; so that, in general, we may consider the space of time required for the production of the disease, consequent upon the application of contagion,

"By the excessive and long continued heat of the sun," says he, "the state of the atmosphere appears to be so much vitiated in *all warm climates, that if some agent or means were not employed, from time to time, by nature to supply it, these countries would become unfit for the residence of human beings.*" History of the Yellow Fever, p. 56.—We cannot for a moment admit that the Almighty Fabricator would leave his work so imperfect as to depend, for its stability, on occasional and adventitious storms.* Is it not more rational, that a certain something, the essence of vitality, should be commixed in the atmosphere of countries subject to great continued heat, in a proportion adequate to counteract its mischievous effects? Shall mankind revert to the error of antiquity, and believe that the torrid zone is

———— corusco

Semper sole rubens, et torrida ab igni—or that there is a region created

———— Sub curru nimium propinqui

Solis, in terrâ domibus negata——

*. What nonsense! there is nothing "occasional or adventitious" with the Creator. Storms & tempests, which our short-sighted beings consider as evils, are the instruments of his Wisdom to effect

as about a trifle short of two days. For although all from whom I have received the information which has enabled me to make the foregoing calculation, have been sensible of receiving the contagion, the instant it was applied, by nausea, slight rigor, and a vertiginous affection of the head, indicating it, yet these symptoms were only momentary. The medical gentlemen of Grenada, who treated this pestilence, all experienced this, were all, with few exceptions indeed, infected, and several fell victims to it. In my own case, wherein the predisposition was debility, the consequence of hepatitis and salivation excited for its cure, which I had recovered from only ten days before, the contagion was applied in the morning, before I had eat any thing. Anxious to examine the body of a man who died of the disease the preceding night, I continued dissecting too long, which the examination of the brain had lengthened out to an hour and an half. I was then sensible of the application of the infection, but remained apparently well till about two o'clock of the following morning, when I was suddenly seized with rigor, chilliness, and some degree of spasmodic affections of my lower extremities. From that moment the disease proceeded in its usual progress, till a salivation put a stop to it.

Of

Of four more who attended the dissection, two were immediately after seized with the fever. My partner, Mr. Campbell, was one of the four, but escaped then. Some days after, however, having visited a patient in the disease, whilst violently heated by riding, the contagion was admitted into his system; the fever took place in nearly its worst form; but a salivation being happily excited, he recovered.

The importance of ascertaining the time which contagious effluvia takes to produce the fever they are the remote cause of, is evident; prevention almost altogether depending on it. Dr. Guthrie, of St. Petersburg, from information received from the medical gentlemen of the Russian army, as well as from the event of the inoculation for the plague in one instance, seems inclined to fix the time of action of pestilential contagion at the fourth day. Dr. Russel says, "In what time after its reception the pestilential virus begins to discover itself, is a point of difficult discussion. The period from unknown causes varies in different subjects; but its effects, in some instances, seem to be almost instantaneous; or, at least, become perceptible in a few hours." In the *Traité de la Peste*, we are told, that nothing has been ascertained relative to this point; that various circumstances develop the effects

of the poison, sooner or later; and that, “ dans les uns, presque sur le champ, au moins du jour au lendemain; ç’a été le plutôt: dans les autres, deux, trois, quatre, cinq, six jours, &c. jusqu’au trente-cinquieme jour, qui est le terme le plus éloigné qu’on ait pû observer.” Dr. Lind seems inclined to think that the effects of common infection are variously produced with respect to time; but that in general the instantaneous excitement of fever, on the admission of infection into the body, or the continuance of apparent health for days after it has been received, altogether depend on the predisposition of the person. “ If a person perceives no symptom of an infection till many days after having been wet with rain, exposed to cold or damp, or having been guilty of intemperance and excesses, it is probable that these causes have excited this dormant poison into action, and that without their influence, it would have never affected their constitutions.” Dr. Rush has made similar observations on the action of the contagion of the Philadelphia fever. “ The seeds of the fever, whether received into the body from the putrid effluvia of the coffee, or by contagion, generally excited the disease in a few days. I met with several cases in which it acted so as to produce a fever in the same day, in which it was received into

into the system, and I heard of two cases in which it excited sickness, fainting, and fever, within an hour after the persons were exposed to it. I met with no instance in which there was a longer interval than sixteen days, between the contagion being received into the body, and the production of the disease.* Thus, so variable is the time which intervenes between the reception of contagion, and the actual appearance of the symptoms of fever consequent upon it, in all climates, that no period can be fixed, at which it becomes active. Under this uncertainty, it may be a judicious measure, to have recourse to the means of prevention, in cases where contagion is suspected, immediately after the exposition of the person to the effluvia from the sick, or to the fomites of infection, whatever they may be.

3d, Another point subject to much uncertainty, and a good deal agitated among physicians, is the distance at which it is possible to communicate the contagion. The result of my enquiry and observation on this important subject, amounts to the following facts: 1st, That those who most carefully avoid houses, where the infection is, are the most certain to escape it: 2d, That

* Medical Commentaries, d. i. vol. viii. Treatise on the Plague, p. 195. Dissertation on Infection, c. ii. s. i. Account of the Bilious Remitting Yellow Fever, p. 27.

although the disease may be in the same house, avoiding the chamber of the sick, prevents infection: 3d, That the merely entering the chamber of the sick, without nearly approaching the diseased person, has never communicated infection: 4th, That approaching too near the diseased person, as to be sensible of the fœtor of his breath; or of the peculiar smell which is always emitted from the bodies of the sick in this disease; or to touch the bed-clothes he lies on; generally occasions nausea, slight rigors, and, often headach, at the moment, and some hours after the disease itself: 5th, That actual contact, so that the perspired fluid of the sick person, may adhere to the hands, &c. of the healthy person, more certainly produces this disease: 6th, That touching the wearing apparel of a person, who is actually diseased, or has just recovered from the disease, as certainly communicates the infection to the healthy person: and 7th, That merely passing a person infected, or who wears the clothes he had on during the existence of the disease, in such manner as that the effluvia, proceeding from them, may be blown on the healthy person, has produced this disease. From hence it is evident, that the infectious effluvia do not extend themselves beyond a limited distance from the person or thing from which they are emitted;

ted; and that this distance may be fixed, at the utmost, at six or ten feet. Dr. Lind, however, thinks, that “ in the open free air, infection does not appear to diffuse itself above fifty or sixty feet from its nidus; though even, at that distance, a person might run some risque from being exposed to a current of air highly impregnated with the contagion which immediately issued from a door or window, where it had been long pent up.”* Although this, during the time the malignant pestilential fever prevailed at Grenada, never, I believe, happened; both accounts may be reconciled, by allowing for the influence of heat in the climate of Grenada, occasioning such a degree of rarefaction of the air, as to prevent the diffusion of contagious effluvia beyond the atmosphere immediately surrounding the infected body, the radius of which may be estimated at six or ten feet. Perhaps the slight hint on this subject, given by Dr. Russel, may tend to confirm this. During the plague at Aleppo, of 1762, with a view to administer relief to the infected, without exposing himself to danger, he took a station at one of the windows of the custom-house lane, about fifteen feet above the pavement, where the infected assembled to re-

* *Essays*, ed. 1774, p. 319.

ceive his advice, and thereby avoided the infection."* Dr. Rush seems also to be inclined to the same opinion, with respect to the radius of infection, when he informs us, that "the contagion infected only across the streets. The more narrow the street, the more certainly the contagion infected. Few escaped it in alleys."† Dr. Blane, too, has very justly observed, that "virulent matter is of such a degree of volatility, as to be readily dissipated in a certain degree of heat."‡ But whatever the limits of infection may be, with respect to its power of acting on healthy bodies, much must depend on the state of these bodies, at the time they are exposed to the contagion.

Before I close this part of my subject, I may offer a few observations on the means of propagating the malignant pestilential fever by clothes imbued with the contagious effluvia. Whatever the principle of contagious effluvia may be, whether the gaseous oxyd of azote, or some unknown oxyd, it has been long ago ascertained that it may attach itself to every thing surrounding the sick, and may be conveyed from one country to an-

* Treatise on the Plague, p. 67.

† Account of the Yellow Remittent Bilious Fever, p. 104.

‡ Diseases of Seamen, p. 279.

other. Indeed, so remarkable has this been, that most physicians consider this means of communicating pestilential infection, as the most certain. It has been already shewn, that the bedding and clothes of the unfortunate people who perished on board the *Hankey*, to which the basis of the morbid effluvia attached itself, were the fomites of the malignant pestilential fever. Similar means frequently afterwards propagated the disease. I could produce many instances in which this evidently happened; but as the fact is well established, it is not necessary to insist further on it here. Two remarkable facts occurred, which displayed, unequivocally, the possibility of communicating the disease from a healthy person, wearing clothes to which the pestilential basis was attached, to another, by merely passing the latter to windward. Captain Bartholomew, of the ship *Sisters*, of London, had his ship at an out-port, *Megrin*; where, although marshes were very abundant, the crew continued perfectly healthy. The Captain himself avoided *St. George's* as much as possible, and resided at *Bacolet*, the house of *Samuel Mitchell, Esq.*; but business unavoidably made him repair thither occasionally. One day, happening to be on the wharf of *Messrs. Thornton, Baillie, and Campbell*, where no boats were permitted to come, ex-

cept

cept those connected with the house, a sailor unexpectedly brushed by him to windward. He immediately perceived an uncommon smell, and a singular affection of his throat, a nausea, shivering, and a slight pain across his eyes. As these, however, were momentary, he thought no more of it, and in the evening returned to Bacolet. On the following day, however, he was seized with all the symptoms of the malignant pestilential fever. On the third day of the fever I saw him, but unfortunately it was too late to administer any thing with any prospect of success. I recommended the pushing the mercurial treatment to the medical gentlemen who attended, but it availed not, for he died on the fifth day. The sailor was identified, and it appeared, from his own information, that he then wore the jacket, &c. he had on during the presence of the malignant pestilential fever in his person. Lieutenant Colonel Pringle, of the engineers, and Captain Irwin, of the royal artillery, had arrived from England about the beginning of April. About the middle of June they were seized with the fever, and died on the fifth day. These gentlemen, fully aware of the pestilential nature of the disease, took every precaution which prudence and apprehension could suggest, and avoided, with uncommon care, all those places where

where infection was suspected. Notwithstanding this, the former was infected by the clothes of a labourer on the public works on Richmond Hill, who had just recovered from the disease. Unacquainted with this circumstance, the Colonel happened to pass close to leeward of the person wearing the infected clothes, and was immediately sensible of receiving the infection, and at the expiration of twenty-four hours, he laboured under all the symptoms of the fever. The latter was infected by lodging in a room in which an officer had died, a few weeks before ; a circumstance he was ignorant of, till after the infection was received into his system. The servants of these gentlemen received the infection during their attendance on their masters, and died. So true it is, as Dr. Ruffel observed on another occasion, that “ the most cautious man upon earth, if not sequestered, could not declare with equal confidence, that he was sure of having had no dangerous communication.*

* Treatise, p. 252,

CHAPTER XI.

The Nosological Character of the Malignant Pestilential Fever—Conclusion.

IT may be expected, and indeed has been required of me, to give a place to the malignant pestilential fever in nosological arrangement; but in the present systems it will be found difficult. The Cullenian does not present any genus of fever to which this can with propriety be referred; and although the celebrated author of it, deals out but scanty portions of commendation on his predecessors,* yet one of them, the Gotten-gen

* “Auctores hi *aliquid laudis* sine dubio merentur, &c. Prolegom, p. 17, 18. With the greatest deference to the opinion of Dr. Cullen, under whom I was taught the rudiments of medicine, it does not appear to me that the word typhus is by any means applicable to a disease whose principle is contagion. The consideration of the words *πληνὴ* and *τοφός*, may, perhaps, direct us to a more clear discrimination of the diseases called plague and typhus. The former, derived from the verb *πλήσσω*, percutio, ico, signifies a blow, wound, sting, blast; and, being frequently used in a figurative sense, is well applied to a contagion, which may be said to act by striking the person exposed to it. The latter, on the contrary, conveys no such adequate idea either of the manner in which contagion is generally communicated, or of the type and succession

gen Professor, seems, with the exception of commixing remittent with continued fevers, to have possessed a more distinct idea of the classification of fevers than any of the nosologists. To his first section of the second order of the febrile class of diseases, I think the malignant pestilential fever may be referred; the character of his "Pestilentialis" being strictly applicable to it, with the addition of one, and the rejection of another symptom only. "Febris pandemia contagiosa, acutissima, in qua bubones aut certé carbunculi, aut vesiculæ oriuntur cum leipyrria, spiritu, sudore et dejectionibus foetidis, delirio, *coma*, nausea, vomitu, pulsuque parvo ac obscuro."

succession of symptoms. The verb *τρωω*, from which the noun is derived, signifies "incendo paulatim, ut gliscat ignis sine flamma;" or it may signify any thing which steals on, or increases imperceptibly: *τρωος* may consequently signify a stupor suddenly impressed, "stupor attonitus," which corresponds with the mode of accession of low nervous fever, but with no febrile disorder of which ardent heat, and other marks of inflammatory diathesis, are the symptoms during the first stage. See Morrel's ed. of the Greek Lexicon of Hedericus. Yet it is under a genus of fevers thus designed that malignant, pestilential, and the yellow fever of the West Indies, as it is called, are placed, diseases differing essentially from each other. He bids defiance, however, to criticism, and intrenches himself behind this explanation: "Little studious whether these names be authorized by the ancient use of the same terms, I depend upon their being understood by the characters annexed to them, which I apprehend to be founded on observation." First Lines, vol. i. p. 109.

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The very uncommon malignity which marked this disease after its appearance, and during its progress at Grenada ; and some of its symptoms strikingly resembling those of pestilence ; the manner too in which it was introduced, and afterwards propagated ; will induce us to consider it as in no small degree partaking of the nature of true plague. We are too imperfectly informed respecting the disease which proved so fatal to the adventurers in the *Bulama* scheme, and the unfortunate crew of the *Hankey*, to decide on the character of it. But sufficient grounds are given us to believe, that if the infection of the jail fever was not brought in the ship from England, an infection, of a nature equally virulent, was generated on board during her disastrous detention at *Bulama*. The statements of Mr. Paiba, from the circumstances related in the first chapter, are subject at least to uncertainty ; and a deviation, when perhaps conciliation, or other motives best known to himself, rendered such convenient, from the account he was pleased to favour me with at Grenada, involves the whole of his authority in suspicion. But this authority is by no means necessary to establish the fact that fomites of infection were preserved on board the *Hankey*, and that the evolution of the pestilential effluvia contained in them, constituted the origin
of

of the malignant pestilential fever. How far this infection partook of a true pestilential character, I shall not take upon me to determine; but the parity of circumstances must strike the least attentive observer. Where this is exhibited in the symptoms, I have already pointed out. Dr. Rush has also displayed the resemblance which obtained between the fever of Philadelphia and the plague. It is generally agreed among writers, who have, themselves, seen and treated the disease in all its various forms, that the only symptoms, which can be, with propriety, considered as characteristic of the plague, are the buboes and carbuncles which appear about the critical period, and generally forerun a revolution of the disease; but it has been at the same time allowed, that the plague does sometimes appear without buboes. But the difference between fevers which derive their origin from infection and contagion is, perhaps, too inconsiderable, to establish that distinction which most physicians are too much disposed to think exists. The utmost that can take place, seeing the basis of infectious or contagious effluvia, is, probably, universally the same, is some modification, which may change some of the features, but leaves the principle of the disease unaltered. And, I confess, I feel little disinclination to believe, with an original and unfortunate

fortunate, but ingenious writer (Brown), that “ the truth is, that systematics have made too much work about eruptive and contagious diseases, and have never dived into the interior nature either of them or almost of any other.” Dr. Ruffel is evidently of the same way of thinking, when he informs us, that although the presence of buboes and carbuncles leave the nature of the distemper unequivocal, yet fatal has been the error of rashly, from their absence, pronouncing a distemper not to be the plague, which in the sequel has depopulated regions, and which early precaution might probably have prevented from so reading.* The observations of this experienced physician, and those of some of the Russian physicians, as they are handed to us by Dr. Guthrie, throw a reciprocal light on each other, and bestow stability on my position. We are told by the latter, that “ there is a line most distinctly drawn between the plague and malignant fever, by the impetuosity and violence of the symptoms, when even no buboes appear; for the patient will be in perfect health in the evening, and in the morning you find the nervous system in such a state of debility, and disorder, that with difficulty you can get answers to the necessary medical questions.”†

* Treatise, p. 98 and 112.

† Med. Commentaries, vol. viii, p. 358. 1st Decade.

The first class of the cases described by Dr. Ruffel, bears the application of this observation in the fullest extent: “The sick in this class were sometimes attacked suddenly with a loss of strength, a confusion or weight in the head, a giddiness that came and went, an oppression at the præcordia, and dejection of spirits. They were inclined to be silent, shewed anxiety in their aspect, but made few or no complaints; and either having no febrile symptoms, or such as were very obscure, were frequently considered by the persons about them as indisposed in a slight degree. These perished sometimes within the twenty-four hours, sometimes the second or third day. They had neither buboes nor carbuncles, and it was very rare to find suspicious marks of infection on the dead bodies.”* Many instances, during the prevalence of the malignant pestilential fever at Grenada, might be here adduced, to shew the applicability of these observations to it. I shall, however, confine myself to one on Monday, July 29th, 1793. Lieutenant Brand, of the royal engineers, felt some uneasiness, and was surprised to see livid blotches appear on his neck and cheeks, and little escars or ulcers in his nostrils. On Tuesday he confined himself to his room, but eat tolerably well, and

* Med. Commentaries, vol. viii. p. 96.

had no particular symptom of the pestilence, except the blotches, which increased much, and began to alarm him. In the evening, the pain in the forehead, &c. which he knew indicated the presence of the disease, came on. He gave himself up to despondency, and cried bitterly, anticipating the fatal consequence. Without any other symptom, except profuse cold sweats, and an almost general lividity, he expired on Wednesday evening.

Upon the whole, therefore, if we draw our conclusion with respect to the diagnostic of the disease, from the remote cause, from the symptoms, from the dissections, I apprehend, we must consider the fever of Grenada, of the years 1793, 1794, and 1795, as truly pestilential, and differing from the plague, strictly so called, only, in not always exhibiting the symptoms that are said to be peculiar to that malady.

PART II.

The Means of Cure employed in the Treatment of the Malignant Pestilential, and Yellow Remittent Fevers.

THE sudden manner in which the malignant pestilential fever attacked, in every case, rendered it impossible to administer any thing in the way of prevention. Had the sick, indeed, been always sensible of the infection, the instant it was applied, no doubt much might have been done in this way; but unfortunately this happened in few instances comparatively speaking; and when it did, none were willing to believe that any dangerous consequence would ensue. In the cure, therefore, of the disease, I was always obliged to begin at, or soon after its actual invasion: but as the symptoms very seldom directed to a proper knowledge of its true nature; and as the fatal termination often happened at a very early period, and unexpectedly, I found it a most difficult, as well as painful task, for some time after the disease broke out, to form a plan of cure.

Finding, at length, the total inefficacy of the usual method recommended in treating malignant fevers ; and becoming, by constant observation on a multitude of cases, in its most violent form, better acquainted with the disease, I founded my plan on the following reasoning.

An adequate attention to the circumstances of the disease, rendered it sufficiently evident, however indirectly marked by the symptoms, that the first stage of the fever was an inflammatory diathesis, peculiar in this respect, that its tendency to terminate in gangrene was infinitely greater than in any other disease I ever met with. It was no less evident, that this stage was succeeded by one wherein nervous excitement, and general debility, with phænomena indicating the presence of internal fever, arising from the gangrenous disposition superinduced, were equally remarkable, and equally tended, with an uncommon rapidity, to the dissolution of the patient. It was also evident, that these diatheses, or states, had an extraordinary aptitude to run into each other, without showing any distinct termination of the one, or accession of the other ; and it appeared, that the imprudent use, or the anticipation of the means of obviating either of them, inevitably hastened the progress of the other to its peculiar termination. Having these facts before me, it
was

was demonstrable, that if I at once went on an unqualified antiphlogistic plan, I would, with certainty, anticipate the fatal issue of the disease, by inducing an extreme degree of debility; and that, on the other hand, if I adopted, at the commencement of my treatment, an unmixed antiseptic plan, I would, with equal certainty, increase the tendency of the existing inflammation to terminate in gangrene. Many proofs of both these fatal errors occurred daily, for some time after the introduction of the disease; and surely the practitioner could not be blamed, when it is considered that the disease was new and unknown in the climate. When, however, a conviction arose in the mind of the practitioner, of the disease being dispossessed of the distinguishing phænomena of fevers of the climate, a blind pursuit of the means suggested by a seeming parity of circumstances, and an ignorance of those peculiar to the disease, became in the highest degree unworthy of a rational physician, and marked his conduct as, in no small degree, criminal.

From the foregoing data, the following indications naturally resulted, and have always since guided me in my practice: for however varied, the remedies may have been, still these were the points to be gained.

1. To discharge from the stomach and intestines, acrid and offensive humours.
2. To counteract the morbid action of the poison of the remote cause.
3. To restore tone and energy to the system.*

* Whilst I admit the difficulty of accomplishing a cure, by pursuing the views displayed by the circumstances which indicate the general means of effecting it, I am satisfied that no rational practice can be adopted, without faithfully establishing those great outlines called indications. In this respect, the art of the physician and the painter bear a close affinity: both first take a general view: the one, of the disease to be cured; the other, of the landscape to be represented: the first must establish his indications, whilst the latter delineates his contour. The future progress of both so immediately depend on the fidelity observed in these great outlines, that their success, or their disappointment, is the necessary consequence: and however artful or beautiful the subservient parts may be, the general effect, without attention to truth, will inevitably fail.

More mature reflection on the nature of that action which constitutes the disease, and of that power which the appropriate remedies possess in effecting a cure, had pointed out the necessity for the change I have made in the description of the indications. The morbid action of the poison of the remote cause, is, doubtless, the proximate cause, or rather the disease itself, and to counteract this, is assuredly to cure it. This, I trust, will appear more evident, from what I have said on the remote cause of the fevers in question, and on the nature of the curative effect of mercury.

CHAP. I.

The first Indication.

IN the common remittent of the country, and indeed in every disease in which there is a bilious accumulation in the first passages, I have generally used a solution of the vitriolated natron and tartarized antimony, in water, in preference to any other evacuating medicine. It possesses the singular advantage of effecting three evacuations in a very short space of time ; and although a powerful emetic, it by no means occasions any untoward irritability of stomach. In the present instance I had recourse to this excellent remedy, and gave it in the following manner. An ounce and an half of the salt, and two grains of the tartarized antimony, being dissolved in a pound and a half of pure cold water, a large wine-glassful of the solution was given every hour to the patient, until a sufficient effect was produced, or until the whole of the quantity was taken. The two first glassfuls generally operated as an emetic, and fully evacuated the stomach ; the medicine after this acted on the in-

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testines,

testines, and excited a copious discharge of their contents. If, at the same time, a diaphoresis broke out, and it almost always did, the patient found himself considerably relieved. I have sometimes, however, dreading the consequence of copious evacuation by stool, contented myself with an emetic alone, composed of from ten to thirty grains of ipecachuana, and one or two of the tartarized antimony; but any advantage, derived from this practice, did not compensate for the loss of time; for if a gentle purge was administered after the operation of the emetic, it took several hours to produce its effect; and if clysters were depended on, their action did not extend beyond the larger intestines. In several cases of the third class, and a very few of the second, in which my assistance was called for very early in the fever, I had the satisfaction of seeing a speedy and complete termination put to the complaint by the solution. This, indeed, was doing what has been recommended by Sir John Pringle, preventing the disease, or rather carrying off its fomites, before they can enter and act generally on the system; but perhaps the means were better. When the disease first appeared at Grenada, fear of anticipating the irritability of the stomach, induced some practitioners, and myself, before I became fully acquainted with the disease,

to give at first a pill of solid opium, and after an hour or two, allowed for its solution, to administer the evacuating medicine ; but, for the reasons already given, the impropriety of this practice must be obvious. As it is highly probable, from the manner in which the contagion acted, that it was carried into the system chiefly by means of the stomach, and intestines, the importance of administering a medicine, which, in the shortest space of time possible, will evacuate them, at the same time that it tends to obviate any general febrile affection which may have taken place, must be evident. I have often derived considerable advantage from using the vitriolated magnesia, instead of the natron, either in the same proportion, or a larger one ; and I have rendered the solution much more palatable, by the addition of lime-juice and sugar.

I have never found it necessary to excite a larger discharge by stool than is barely sufficient to fulfil literally the first indication : and from the wonderful aptitude of the persons of the sick, in the malignant pestilential fever, to sink into an irremediable state of debility, under alvine evacuation carried beyond this, I have considered it as unjustifiable, in every respect, to adopt such practice. I perceived, after employing the means I have described for a considerable time, with various

rious success, that the uncertainty of the period at which the morbid poison entered into, and began its action on the system, together with the variable changes produced by it, afterwards, sometimes extremely violent when least expected, and sometimes moderate, although circumstances led to the formation of a different prognostic, rendered the use of a remedy which might cleanse the first passages, and with more certainty counteract the operation of the morbid cause, at the same time, extremely desirable. It was not, however, till the disease re-appeared, in 1794, that I thus endeavoured to combine the two first indications; and I found it a more simple, a more judicious, and a much more successful method. I, at that time, gave the first dose of calomel, the moment I saw the patient, alone; and repeated it in the same manner, till the intestinal canal was cleared of its contents. This object being effected, I added opium, to restrain its action on the intestines. After my return to the West Indies, I was induced, from the costiveness which obtains in the malignant pestilential fever, and from the representation of some respectable practitioners, as well as from the greater certainty of the mercurial being taken up by the absorbents of the intestines, when unclogged by feculent matter, to increase the activity of the calomel by
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the addition of jalap, or any other purgative medicine of quick operative effect. The advantage obtained by this is obvious ; but it is evident, that when the indication is fulfilled, no more in this way should be attempted. The great rule, in short, is to empty the intestinal canal as speedily and as completely as possible, so as to prepare it for the reception and absorption of mercury. Except in very slight cases of the disease, vomits should never be exhibited : for the irritability they may give rise to, can never be compensated by the partial and imperfect evacuation they may produce.

It is remarkable, that a very perceptible coincidence prevails between the first curative indication of this fever, and that of the plague. Dr. Ruffel observes, that “ the neglect of purging at the beginning, was not followed by the consequences which might rationally have been expected ; and I never saw any acute distemper where costiveness was attended with so little inconvenience. Nevertheless, I think it rational, by gentle means, to clear the bowels at the beginning from any colluvies that might happen to be lodged there, &c.”* Before I dismiss the con-

* Treatise on the Plague, p. 151.

sideration of the means of fulfilling the first indication, I may take occasion to observe, that Dr. Rush seems to have misconceived my view in the administration of mercury in the malignant pestilential fever, till salivation is excited. He says, “ Dr. Chisholm has lately endeavoured to rest the cure of malignant fevers wholly upon the evacuation obtained from the salivary glands by means of mercury ;” and adds, “ from the description the Doctor gives of the state of the pulse, of the frequent hæmorrhages which occurred in the Boullam fever, and of the state of the brain after death, I am satisfied that bleeding and purging would have rendered his practice much more successful.”* I have given my opinion very fully in another part of this work, of the use of purging in this fever, as a principal remedy ; and, therefore, I shall offer no further remark here, than, that if experience can be considered as the true test of the efficacy of a practice, it certainly presents us with a decision very different indeed from that made by Dr. Rush, as far as relates to a tropic climate, at least.

At St. Croix, in 1796, I had the good fortune frequently to meet and converse with Dr. Stevens,

* Med. Inq. and Obs. vol. iv. p. 112.

on this subject, before I saw Dr. Rush's 4th volume of Medical Inquiries and Observations. At his request, I explained to Dr. Stevens very fully my practice; and I was the more inclined to do so, as he informed me, that Dr. Rush, in his Lectures, maintained, that saturating the system with mercury, in the treatment of the malignant pestilential fever, and administering it with a view to obviate pestilential inflammation, were not my objects; but that the effect I aimed at was simple evacuation or depletion. It is always pleasing to meet with a gentleman willing to acknowledge former error, and adopting truth from conviction. Dr. Stevens, whose paper, inserted in Dr. Rush's first publication on the Philadelphia fever, contains a warm recommendation of the tonic practice, formerly almost universally adopted by the West India practitioners, in the yellow remittent fever of the country, on becoming acquainted with the true nature of the fever of Philadelphia, and of that which so fatally prevailed in the West India Islands during the years 1793, 1794, and 1795, saw the impropriety of the tonic, and became a convert to the mercurial treatment. The Doctor assured me, that at the time he hastily drew up, at the request of Dr. Redman, the paper Dr. Rush has published, he had not seen a single instance

stance of the prevailing epidemic ; but having been informed, without receiving a precise and correct statement of the symptoms, that it was the endemic yellow remittent of the West Indies, he stated the practice he had himself pursued in the latter.

CHAPTER II.

The Second Indication.

TO fulfil the second indication was infinitely more difficult; and the danger in making an improper choice of the means, much greater. The fate, indeed, of the patient altogether depended on the judicious selection of means in removing the inflammatory diathesis, without producing a tendency to the consequential gangrenous disposition. As the means were various, and attended with various success, I shall treat of each in a distinct Section.

SECTION I.

Bleeding.

IT has been very generally recommended to draw some blood, before other means are used, at the beginning of malignant and pestilential fevers. In the present instance, the ardent heat of the surface, the oppressed hard pulse, the pain of the side, the oppression at the præcordia, the head-ach, and the throbbing in the temples, seemed

seemed strongly to indicate the use of bleeding. Very little experience, however, was sufficient to show the impropriety of it; and, instructed by repeated examples of its hurtful effects, I very early laid aside all thoughts of lessening the inflammatory state by means of it. Although the blood drawn in the cases wherein this remedy was employed, was remarkably florid, and always threw up an inflammatory crust of greater or less thickness; and, although the pains seemed to undergo a temporary mitigation, yet the consequence, at the expiration of a few hours, was always fatal. I was the more surprized at this event, because the patients were remarkably robust, florid, and generally in the vigour of life.

This was my opinion of bleeding, in the malignant pestilential fever, at Grenada, when I first published on that disease. With a trifling modification, it is the opinion I now hold, after again seeing the disease, and after becoming acquainted with the sentiments on it, of the most judicious West India practitioners. I am satisfied, that when it is possible to see the sick in this disease, at the period of its accession; that when these are young robust men immediately from England, or any other country possessing a similar climate; that when the temperature of the weather is such as seems most to favour the propagation

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tion of the disease ; and that, when the predisposing causes have been such as have a tendency to accelerate the motion of the fluids, and to give rise to other unequivocal signs of an inflammatory disposition ; then one plentiful bleeding may, undoubtedly, be of infinite service. But when most of these circumstances are absent ; and when, consequently, no just indication for the employment of this remedy can be formed, I consider the use of it as a wanton abuse of confidence, and as inevitable destruction to the patient. This observation may be extended to the yellow remittent fever without limitation : for, in it, the means of unqualified depletion are fully as pernicious as those of repletion, or those which serve to maintain or augment the vigor and tone of the body. In a cold climate, where the circumstances I have stated as rendering bleeding, at least, not an injudicious remedy, in these fevers, may exist separately or combined, it may be employed, I have no doubt, with more freedom ; and if the tendency of the inflammation to affect particular organs should be great, the indication becomes proportionally more evident. It must have been the concurrence of these, which rendered the astonishing freedom Dr. Rush employed it with, necessary. A boldness, such as his, however,

must not even be thought of in a tropical climate, in such fevers, unless the practitioner feels himself inclined to be accessory to the death of his patient: for it is an observation, founded on a multiplicity of facts, that, not a single case, in which bleeding has been employed as a principal remedy, has terminated favourably. Dr. Rush informs us, that he was principally induced to bleed freely, by the tenseness of the pulse, and the intenseness of the inflammatory diathesis, proceeding from the coldness of the weather. "In the beginning of September I found one or two moderate bleedings," says he, "sufficient to subdue the fever; but, in proportion as the system rose, by the diminution of the stimulus of heat, and the fever put on more visible signs of inflammatory diathesis, more frequent bleedings became necessary." During the prevalence of the same epidemic, in hot weather, or in a temperature similar to that of the West India Islands, viz. 80°, bleeding was found, *even* by Dr. Rush, to prove fatal. As he has not stated the temperature of the atmosphere, during the presence of the Philadelphia fever of 1794, we cannot perceive the precise necessity for the excessive bleedings he mentions as having been then necessary. It is remarkable, however, that his Table exhibits a
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greater number of large bleedings in the month of October, 1794, and of January, 1795, than in those of August and September.*

Notwithstanding the unbounded faith of Dr. Rush in bleeding, it does not appear that it was a remedy so universally, and perhaps, I may add, indiscriminately, employed in other parts of the United States, where, it is reasonable to suppose, the circumstances of climate, &c. were not dissimilar. Dr. Bayley thus expresses his opinion of bleeding in the epidemic fever of New York during the summer and fall of 1795. "In general, the indications of cure were not supposed to include this operation; it was, therefore, but seldom had recourse to. In some of those cases in which the lancet was used, the good effects of bleeding were obvious, more especially in relieving the distressing pain in the head; whereas, in other instances, and where the symptoms seemed to render it peculiarly proper, it did not afford the relief that was expected from it; but, on the contrary, although the quantity of blood drawn was copious, and the bleeding frequently repeated, the patient sunk under the disease." The opinion of Dr. Seaman, of the same city, is nearly

* An Account of the Yellow Remittent Bilious Fever, p. 271, 279, 281.

to the same effect.† It is useful to attend to the difference of opinion Dr. Rush held during the fever of 1797. The Editors of the Medical Repository, giving an account of a later publication of this deservedly celebrated physician, than I have seen, thus state the effect of blood-letting in that fever. “The cure was, in most cases, begun by blood-letting, when the author was called on the *first day* of the disease. When *employed later*, the advantages of this remedy became more precarious, and, in many instances, it obviously did harm.” We are presented with no account of the temperature of the weather; but the accompanying remarks of the Editors are highly judicious, and should never be lost sight of by the practitioner. “The attempt to establish general rules for the use of blood-letting, in pestilential diseases, is extremely difficult, if not impossible. Every epidemic season, and every individual case, justly claims the right of deciding for itself. In one season, the disease may generally assume a high inflammatory character; in another, the power of reaction may be chiefly lost, and the system constantly sink and dissolve under the ma-

* Bayley's Account of the Epidemic Fever which prevailed in the city of New York during part of the summer and fall of 1795, p. 113. Webster's Collection of Papers on Bilious Fevers, p. 44.

lignity of a decomposing poison. Similar differences may take place in individual cases. In the one instance, blood-letting may be the anchor of hope; in the other, it may precipitate death. And, besides the extreme cases, there are mixed and doubtful ones, where danger threatens on every side, and a choice of difficulties only remains.”*

The principal advocate among the staff physicians of the West India establishment, for this means of removing the inflammatory diathesis in the malignant pestilential and yellow remittent fever, recommended strongly the opening of the saphena vein, in preference to bleeding at the arm, and his reasoning was not injudicious. “I am convinced,” says Dr. Shuttleworth, “from experience, that bleeding from the saphena is more efficacious in the cure of these fevers, than bleeding from the arm. I prefer drawing blood from the saphena, not upon the old doctrine of revulsion, but because I conceive that bleeding from the arm has, in some cases, occasioned too sudden depletion of the brain, particularly when used on the third or fourth day of the disease, although the strength and fulness of the artery demanded it very forcibly. It has occurred to me, that

* Med. Rep. vol. 2. p. 190.

bleeding at the arm, at that period, has, by too sudden depletion of the brain, and, consequently, by weakening too suddenly the nervous energy, superinduced the state of debility so extremely dangerous, and so much to be dreaded in these diseases." Immersion of the patient's feet in hot water was employed as secondary to this remedy, by relaxing spasm, and lessening, consequently, the throbbing pain in the head, and the burning heat in the eyes. I have had no experience myself of the efficacy of this method of diminishing the inflammatory diathesis peculiar to these fevers; but, as there is a strong probability of obtaining a very important advantage, by means of it, I cannot avoid recommending it.*

Dr. Wright thought very correctly on the use of this remedy. He says, "the use of the lancet we judged unnecessary, and dangerous in the extreme. Perhaps, in some ardent fevers, where the symptoms run high, bleeding may be necessary; but such cases did not occur here. In

* Dr. Shuttleworth is generally allowed to have been a judicious practitioner; but his moral character many have decided on with violence, with rancour, and perhaps with malevolence. The impartial and intelligent observer may, with Memmius, thus depict the contest: "*Dominari illi volunt; vos liberi esse; facere illi injurias; vos prohibere; postremo fociis vestris veluti hostibus, hostibus pro fociis, utuntur. Potestne in tam diversis mentibus pax, aut amicitia esse.*" Sallust in Bell. Jugurth.

every case of fever, of whatsoever kind, where bleeding had been practised, the fever sometimes was removed; but the patient often fell into ill health, or remained long in a convalescent state.”*

It does not appear to me that the comparison instituted by Dr. Rush, of his depletory system, with the modes of treatment pursued by many physicians, who practised in the West Indies, is at all decisive with respect to the superior efficacy of the former: for almost all the methods quoted are founded on a false theory of the nature of the disease, and are calculated to produce an effect highly injurious to the sick. It should, besides, be always adverted to, that the circumstances of climate, &c. must influence very essentially the practice in a disease, and give a preponderance either way in the selection of the means of cure. But what have those practitioners observed, who have adopted the depletory system in the malignant pestilential and yellow remittent fevers? Dr. Clark, of Dominica, informs us, that “from the remarkable flushing of the face, great inflammation of the eyes, and full pulse in the first stage of this disease, young practitioners might be induced to use the lancet

* MSS. Report of his Practice, &c. to the Army Medical Board, since published in the *Annals of Medicine*.

freely, and the French surgeons, whose chief remedy in almost all disorders in these islands is venæ section, very readily fell into this error. *There was not a single instance of an emigrant recovering who had been bled.*" Dr. M'Lean, who seems strongly inclined to fall in with Dr. Rush's way of thinking on this subject, recommends blood-letting in the remittent fever of St. Domingo; but it appears to me that he employed it with scarce any other view than as a preventive, in cases, the subjects of which were robust Europeans."—"The French, indeed, had bled very freely, at every stage of the disease, but they carried it beyond the proper bounds, and I saw an instance or two where their patients sunk under the evacuation."* Dr. Todd, of Jamaica, thus states the general result of the depletory system in that island: "Blood-letting, which excited so much discussion, and had so many advocates *in consequence of the temporary abatement of the general symptoms*, is now very nearly abandoned; nor was it relinquished, by its supporters, but on the most complete proofs of its fatal effects."† The testimony of Dr. Wade, of Bengal, is not unapplicable here. "Instances have

* Enquiry into the Nature and Causes of the Mortality at St. Domingo, p. 137 and 164.

† Annals of Medicine, vol. i. p. 311.

occurred in which delirium did really appear to follow the venæ section. The deceitful interval of ease which succeeds this operation, soon vanishes; the fever rekindles, probably with redoubled fury, and finds the patient much less capable of resistance to its violence, exhausted by the bleeding, &c." After some very free strictures on the encomium of Dr. Moseley on this remedy in the yellow remittent fever, he observes, that "the same form of fever is by no means unfrequent in Bengal, but it is to be hoped that the same remedy will always remain of very unfrequent use in that country."*—I may here observe, that all the cases of yellow remittent fever in the Ordnance Hospital at Fort Royal, in the year 1798, in which bleeding was used, died, without one exception.

As a preventive of yellow remittent fever in strong plethoric constitutions, I am convinced a better remedy cannot be employed. Lieutenant William Lloyd, of the Royal Artillery, furnished in his own person, a remarkable proof of this. This gentleman came to the West Indies for the first time with Sir A. Abercromby's army, and soon after his arrival was employed in the siege of Morne Fortunée, in St. Lucia. The Artillery

* Paper on the Prevention, &c. p. 72 and 75.

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suffered extremely from the difficulty and labour they experienced in bringing forward the battering train. Mr. Lloyd's uncommon plethoric habit rendered such service to him literally a service of danger, exclusive of the usual contingencies of a siege; and, accordingly, one morning he came to me labouring under all the symptoms of an incipient yellow remittent fever. These and his habit indicated bleeding; and a very liberal evacuation in this way being made, and followed up with quiet and dilution, at the expiration of twenty-four hours, he was perfectly recovered, and fulfilled the duties of his station with his accustomed alacrity, and with the satisfaction of feeling himself able to do so with impunity from the climate. My ingenious and experienced friend, Dr. Franklin, of the medical staff of the army at St. Pierre's, favoured me with a fact which illustrates this observation, and demonstrates the impropriety of bleeding, in the treatment of these fevers, but when it is indicated by the most evident plethora, joined to the European constitution unaffiliated to the tropical climate. This gentleman informed me that of a certain number of German corps, Hompesche's, then (1797) newly arrived in the country, and who were remarkably robust and florid

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complexioned young men, labouring under the yellow remittent fever, three-fourths were bled freely at the accession of the disease, and recovered without the use of any other material remedy. A number, nearly equal, of men newly arrived, but very differently circumstanced with respect to constitution, were treated by another gentleman of the hospital at the same time, in precisely the same manner, but they all died.

In the plague, bleeding has been generally employed with the same view, viz. to prevent the complete formation of the fever, or to render the inflammatory stage more mild. And even Sydenham, although a strenuous maintainer of the necessity for bleeding in the plague, yet exhibits the caution which influences all prudent physicians in the admission of a remedy so greatly debilitating in a malady, the tendency of which, to terminate in extreme debility, is so remarkable. “His observatis,” says he, “nemo rationis capax, jure, in his morbis, vituperare missionem sanguinis potest, sed mirifice et tanquam *divinum auxilium* commendare, extollere, et confidenter usurpare.” In this passage he adopts the opinion of Borellus, but he afterwards qualifies the extravagant encomium, by informing

ing us he prefers sweating—"ulpote quæ nec ægrorum vires æque prosteruat, nec medicum infamiciæ periculo obiectat."*

SECTION II.

Sweating.

HAVING thoroughly cleansed the primæ viæ, my next object, before I became sufficiently acquainted with the proper method of treating the malignant pestilential fever, was to encourage a diaphoresis, if it had already come on, which, I have observed, frequently happened in conse-

* Ruffel on the Plague, b. 2, ch. 5. Sydenhami opera, p. 119, 4to edit. Notwithstanding my opinion is adverse to the adoption of this remedy in the pestilential fever which has raged so fatally in the West Indies and America, and the yellow remittent fever, after the incipient stage, yet I well know there are certain conditions, and a certain state of the system in tropical climates, and more especially when determinations to particular organs, as the liver and lungs, are wonderfully great, wherein bleeding, even to a greater extent than that practised by Dr. Rush, in Philadelphia, becomes a remedy indispensably necessary. An instance of this I sent to Dr. Duncan, of Edinburgh, in the year 1786, and as the paper has been published in the 1st vol. of his Second Decade of Commentaries, I beg leave to refer the Reader to it. In some instances it will appear ten pounds of blood were drawn, with astonishing success, and without inducing a dangerous state of debility during convalescence. The largest quantity drawn by Dr. Rush, in fifteen bleedings from the same person, was 150 ounces, or ten ounces less than that drawn at Grenada.

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quence of the use of the evacuating medicine; or, if it had not, to promote one. For this purpose I made use of various means; such as the saline draughts of Riverius, with or without the addition of the ætherial spirit of nitre or vitriol; and I often preferred this addition, on account of the suppression of urine. In all cases, the symptoms of which did not run high; this was a most useful medicine; and, although the taste was often complained of, it seldom deranged the stomach. With this I generally gave a powder every two hours, composed of nitre, camphor, and the pulvis antimonialis; and in order to give these medicines a greater tendency to act on the skin, a few drops of laudanum were occasionally added to the draught, or a small proportion of opium joined to the powder. Perseverance in this plan, in the less violent cases, was sometimes attended with success; for the pulse becoming slower and soft, the pains abating, and the skin being covered with an agreeable moisture, all that seemed necessary to complete the cure, was to prevent the tendency to a gangrenous disposition by the liberal use of bark, wine, and nourishing food. The insidious nature of the disease, and the uncertainty of a remedy, which cannot always be administered without risking the application of a dangerous degree of external

external heat, and producing an irremediable irritability of stomach, and seldom securing a considerable or permanent advantage from its operation, point out sweating as far from being appropriate, or unadmissible, except in cases where the danger is evidently trifling.

SECTION III.

Mercurial Treatment in general.

I SOON discovered, however, that the success attending the operation of evacuants and diaphoretics, imperfect at best, was confined almost exclusively to the third class of patients. The more violent cases of the disease, in which the sick were hurried out of existence, wherein the whole frame was agitated by a conflict the most dreadful, demanded a treatment in which the most vigorous and speedy decision, the boldest perseverance in the adopted plan, and the closest observation and attention, became absolutely necessary. In these cases, local inflammation was more clearly indicated than in others; but bleeding was, if possible, a more dangerous remedy here than in them. Finding all the antiphlogistics I had hitherto used totally ineffectual, and that bleeding was on no account ad-

x. Surely the author's language here is extremely vague.^{miffible,}

missible, I had recourse to the only remedy left me, mercury. I have explained, in another part of this work, my motives for employing mercury in the malignant pestilential fever, and, therefore, shall here observe only in general, that I was encouraged to the practice by the appearances I perceived in the two first bodies I opened. The liver was evidently the most diseased part, and I knew that mercury was specific in all inflammations of that organ; besides, it was, at all events, better to try a doubtful one, than remedies of no efficacy. I accordingly administered calomel either combined with nitre, camphor, and the antimonial powder, or in the form of a pill. After many trials of both, I preferred the last, chiefly on account of the nitre and camphor disagreeing with the stomach. The pill was generally composed of five grains of calomel, two of the antimonial powder, and one of opium, and repeated four times in the twelve hours, or eight in the twenty-four. I confess it was with no small degree of anxiety I ventured on this practice, unwarranted by any other authority than dissection and my own observation; but its success justified my temerity. If salivation was speedily raised, the danger was removed, and the patient recovered. But in order to effect this, it was frequently necessary to increase the quantity

tity, and number of the doses ; and in several instances, I pushed it, to what I then considered an almost incredible length, with astonishing success. In one case, in particular, in whom signs of recovery did not appear till the twenty-first day, fully 400 grains were given before the salivary glands were affected.

I have here stated my practice, and the extent I thought myself warranted to carry the mercurial treatment during the presence of the pestilence in 1793. As it then not unfrequently happened, from the necessary timidity a practitioner feels who adopts a new remedy in the treatment of one of the most dangerous and destructive maladies the human frame is subject to, that that remedy was not always pushed to the length which secures its efficacy ; so on the reappearance of the disease in 1794, I was determined to give calomel earlier, and in much greater quantity than the preceding year. Accordingly, instead of preceding the administration of this excellent remedy, with the usual evacuating medicines, I began with it, and continued without the interposition of any other, till salivation took place. The success attending this practice exceeded my most sanguine expectation ; so great, indeed, was it, that I did not lose a single patient in whose case it was pushed to the full extent.

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My practice will, no doubt, by many be considered as unwarrantably bold ; but as its wonderful success has been experienced by several other practitioners, who can bear testimony to it, I feel not the smallest hesitation in recommending it with all the fervour which an earnest wish to save the lives of men, and the fullest conviction of, what, I am almost inclined to say, its infallibility can give rise to.

My mode of using the calomel after the re-appearance of the malignant pestilential fever in 1794, was to give ten grains, either alone, or with an equal or a double quantity of jalap, to an adult patient as soon as possible after I saw him. This generally acts as an evacuant in the degree required, about an hour or two after it is given. At the end of three hours I repeated the dose of calomel. At the end of three hours more, the same quantity is given, adding opium or not as the preceding doses have acted. In this manner ten grains of calomel were given every three hours till the salivary glands became affected, which generally happened in less than twenty-four hours from the commencement of the treatment, if it was faithfully conducted. The effect of the medicine given in this manner, may be perceived after the third dose in general ; the patient becoming calmer, less restless, less anxious ; his skin

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being softer, and possessed of an agreeable heat ; the stomach being perfectly retentive, however irritable it might have been before ; and the eyes recovering their former lustre and sensibility. When at length salivation takes place, the patient is left free from disease, with a moderate warm moisture on his skin ; and very soon after, signs of returning health are indicated by calls for food, &c. The recovery of strength is proportionally rapid to that from disease ; nor is it at all necessary to have recourse to bark, or any other medicine whatsoever ; a circumstance truly gratifying both to the patient and the physician, in a disease wherein nature revolts at the very idea of it. There are circumstances, however, in which the utmost difficulty is experienced in obtaining this effect from the calomel ; and others in which the candid practitioner must acknowledge its insufficiency. The necessary adjuncts in such, are detailed very fully in the 4th Chapter of this Part.

I mentioned, on a former occasion, that the small number of deaths in the 45th regiment, during the prevalence of the malignant pestilential fever at Grenada, in 1793, arose from the mode of treatment adopted by Mr. White, a very ingenious young gentleman, who attended the sick in the absence of the surgeon. The disease being new, its symptoms remarkably insidious, and

and its fatal tendency very uncommon, Mr. White did me the honour to consult me, and request my opinion and advice. I mentioned to him the difficulties I had for some time laboured under, the result of my observations, and the treatment I found alone useful in the more violent cases; and recommended it to him as the most likely to be successful among his patients. He immediately adopted it; and frequently afterwards declared to me he did not lose one man who had taken a sufficient quantity of calomel to excite salivation.

On my way to Europe, in the month of July, 1794, I was detained a month at St. Christopher's, waiting for convoy. During that time I had frequent opportunities of conversing about the malignant pestilential fever, with some ingenious and eminent practitioners of that island; who informed me, that the want of success they had experienced in the various modes of treatment they adopted during the prevalence of that epidemic in the year 1793, made them dread a second visit of it as the greatest calamity that could befall the colony. At this time the arrival of a ship at Basseterre, from Martinico, with the malignant pestilential fever on board, gave me an opportunity of displaying the efficacy of the mercurial treatment, which had never before been

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thought or heard of there. Dr. Armstrong, who, to the most pleasing manners of a gentleman, adds uncommon medical skill, and the candour which always accompanies both, attended the sick on board this vessel. The first patient was a strong robust man, some time before arrived from Europe, and who had the further disadvantage of having been three days ill before medical assistance could be called in. The worst symptoms had already appeared; such as continual vomiting, coma, and the delirium peculiar to the disease. The Doctor, by my advice, began with ten grains of calomel, and repeated it without opium, as it did not purge, every three hours. To his astonishment, and contrary to the prognostic of the other medical gentlemen, to whom he communicated the case, a salivation coming on before the expiration of twenty-four hours, the usual signs of returning health immediately after succeeded.

I shall subjoin, in the fourth Part, several valuable communications on the use of mercury as a principal remedy in the treatment of the malignant pestilential, and yellow remittent fevers, I have been favoured with since my return to the West Indies. And these, together with what I have here offered, and what is contained in the Chapter on the use of mercury, I presume will constitute

constitute a body of evidence sufficient to establish the truth of this remark, that mercury is the only remedy in which confidence can be placed in the treatment of the malignant pestilential and yellow remittent fevers, with the sole condition of diminishing or augmenting the tone of the system as may seem necessary to the judicious and experienced practitioner.

It is with peculiar satisfaction I acknowledge my obligations to Dr. Rush for supporting, in a masterly manner, my attempt to diffuse generally this great truth; and it is the more pleasing as it has proceeded from a conviction of its existence, and not from any party view, so unworthy the character his conduct has established. This gentleman's character has been greatly exalted by his benevolent exertions, and his unwearied perseverance during the existence of the several epidemics at Philadelphia, since the year 1793, in relieving his helpless and afflicted fellow-citizens, and in pursuing the mercurial mode of treatment, with the weight of prejudice and malignity in opposition to him. Such fortitude is rarely met with in the medical profession; and when it is it must secure our admiration and respect. The points in which we have differed, except what relates to the origin of the Grenada and Philadelphia fevers; and the principle on which the

mercurial action depends in the cure of them, are perhaps reconcilable by admitting the agency of climate. Whether what I have said on these points may carry conviction to the Doctor's mind, I know not : whether it does or not, a difference of opinion can never efface the impression his general conduct has made on mine.

I have also had uncommon satisfaction in reading the following note in the ingenious Dr. Clark's late publication : " Observations on the Diseases which prevail in long Voyages to Hot Climates, &c. vol. ii. p. 297. " When engorgement of the brain takes place, to any considerable degree in fevers, no medicine which has hitherto been recommended is capable of removing it ; and therefore I hope I shall be excused for proposing mercury (the only medicine which has been found adequate to remove obstinate congestions in the other viscera), in such a deplorable and dangerous situation. But at the same time, I confess I am not able to point out the particular cases to which this practice will apply, from not being able, certainly to distinguish *engorgement* of the brain from mere irritability of that organ, the symptoms of both being the same." I trust the observations I have offered will remove the difficulty started by Dr. Clark, and direct the practitioner, in the exhibition of mercury, in malignant

nant pestilential fevers at least, to those stadia of the disease wherein it is the only remedy that can be given with advantage. I am confident, not from analogy, or the probability of the thing, but from actual and very extensive experience, and from the result of the observations of the most respectable and intelligent West India practitioners, that mercury is, in general, the only truly useful medicine in all fevers depending on congestions of the viscera, or, as I have expressed it elsewhere,* on glandular obstruction and visceral inflammation. And is it not probable, that all fevers depend, proximately, on those causes? Upon the whole, the weight of evidence in favour of the mercurial treatment, brought forward by Dr. Clark, Dr. Rush, Dr. Wade, and myself, in circumstances nearly similar, must surely impress every mind, even those most influenced by prejudice and theory, with a conviction, not only of its utility, but of its certainty, if judiciously conducted. In India, in England, in North America, and in the West India Islands, medical gentlemen, totally unconnected with each other, have recurred to the same practice, and hesitate not to declare to the public, that the event has been uniformly the same. Why should not pes-

* Med. Comment. d. ii. vol. ix.

tilential infection have its antidote, as well as others once equally fatal? "They have narrow conceptions not only of the Divine Goodness, but of the gradual progress of human knowledge, who suppose that all pestilential diseases shall not, like the small-pox, sooner or later cease to be the scourge and terror of mankind!"* Let the knowledge of this salutary innovation in medicine be generally diffused; let the confidence it merits be placed in it; let the pernicious dogmata of theorists be discarded, and no more will pestilential fevers be numbered among the widest outlets of human life.

My comparative want of success in treating this dreadful malady with any other means than those I have mentioned, might render any account of them unnecessary. I shall, however, offer a few observations on the most remarkable of them, chiefly with a view to shew how inefficacious remedies strongly recommended by experienced and judicious writers in certain states of the malignant fever, were found to be in the disease before us; and to guard the young practitioner against the deceitful and fatal reliance on great authorities, he is so apt to fall into; against

* Rush's Account of the Yellow Remittent Bilious Fever, p. 327, 329.

doctrines and practices promulgated by men esteemed the greatest light, but in this instance, as Dr. Wade very justly observes, the *ignes fatui* of their profession.

SECTION IV.

Blisters.

WHEN symptoms of local inflammation are so strongly marked as they were in many of the more violent cases of this disease; and in a low state, in which the most powerful stimuli are indicated, blisters, we should imagine, would be pre-eminently useful. Dr. Lind in many places recommends blisters as the most effectual remedy in the early stages of malignant and infectious fevers; and as often even preventing them. Nay, he goes so far as to consider the effect of blisters as the most certain proof of a prevailing infectious fever.* On the other hand, many, as Dr. Huxham, Sir John Pringle, Dr. D. Monro, M. Poissonnier, and Dr. Cullen, recommend blisters in the low stage only. The latter observes, in general, on this subject, that “ blistering may be employed at any period of continued fevers; but that it will be of most advantage in the advanced

* On Fevers and Infection, c. ii. f. i.

state of such fevers, when the reaction being weaker, all ambiguity from the stimulant power of blistering is removed, and when it may best concur with other circumstances tending to a final solution of the spasm."* The event, however, in the malignant pestilential fever displayed the fallacy of such reasoning; and demonstrated the insufficiency of all remedies, the operative effect of which is not directed against the principle on which the disease depends, but against particular symptoms. Blisters were of little or no use at any period of the disease, or wherever applied. In order to mitigate the intolerable violence of the headach, I have blistered the whole head, and the inside of each thigh, at once, in several cases, without producing the least change in that or any other symptom. I have had recourse to this remedy to lessen pain, to remove irritability of stomach, and to raise the vital powers in the low comatose state; but always, except in two cases, without success. In one of these, a soldier of the royal artillery, the irritability of the stomach was completely removed by a blister applied to the scrobiculus cordis. The other case was singular. In a tradesman of the town of St. George, all the symptoms of the disease appeared,

* First Lines, vol. i. p. 178.

except the febrile heat: a blister was applied between the shoulders, without administering any medicine previously, except the solution, which operated very moderately. The effect was wonderful: the discharge was uncommonly large, black, and foetid in an intolerable degree; and the instant this took place, the patient became better, and, soon after, without the use of any other remedy, recovered. A medical gentleman of the army, at that time attached to the 67th regiment, informed me that in his own case, as well as those of four or five soldiers, he experienced extraordinary relief from the application of a blister to the fore part of the head, or sinciput. It is probable that the cases he treated were less violent than most of those which occurred in my practice; otherwise it is impossible to account for so great a difference of result in the same practice.

The many opportunities I have had since the publication of the foregoing opinion, of seeing the malignant pestilential fever, and yellow remittent, have only tended to the confirmation of it. There is only one advantage I know of, which can arise from the practice in these fevers, and that is, exposing an absorbing surface more perfectly to the mercurial applied; and much, no doubt, in this way may be done, when the sensibility

sensibility of the body is greatly diminished by the action of the morbid cause. I confess, I expected considerable assistance from blisters in the yellow remittent fever, partly from what they had afforded frequently in the common remittent, when applied to the inside of the thighs; and partly from the recommendation of many West India practitioners. The practice of blistering the thighs is warmly recommended by a very judicious physician, Dr. Hume, in his short, but useful treatise on the True Bilious or Yellow Fever of the West Indies:* and in some fevers which I had occasion to treat in Grenada, formerly, and which approached nearly to the character of the yellow remittent bilious fever, it was a practice which certainly possessed no small share of efficacy. In the true yellow remittent, however, it has uniformly failed, under my direction, as well as that of many who have communicated the result of their practice to me.†

* Letters and Essays by different Practitioners in the Diseases of the West Indies p. 222.

† Dr. Wade so entirely coincides with me in his opinion of this remedy, that what he has said on the subject, may be considered as a further confirmation of its inutility, p. 56.

SECTION VI.

Bark.

FROM the history of the disease, it will not appear extraordinary that practitioners should have recourse to bark very early in it; and before they become sufficiently acquainted with its true nature and peculiarities. The suddenness of the changes, and the apparent sinking of the vital powers, a few hours after the accession of the fever, naturally incline us to consider it as a disease wherein tonics and antiseptics, with the whole tribe of cordials, could be alone useful. But no indication can be more fallacious than this; and innumerable instances occurred of the fatal consequences of adopting it. The use of the bark in the violent cases of the malignant pestilential fever, immediately after the operation of the evacuating medicines, was hurtful in the extreme; and many continued the practice, notwithstanding the glaring absurdity, as well as danger of it. But by way of removing spasm, and obviating the tendency of the phlogistic diathesis, which they considered as unimportant, put in competition with the expected putrefaction, they accompanied it with warm bathing, either partial or general, and occasional purges. Their success;

as might be expected, was proportional to the unaptness of the means.

In every case wherein salivation took place, little further was required than the plentiful use of simple nourishing food, and wine. But when the mercury had not this effect, or when its action was so tardy as to give room for the most serious apprehensions of the event, it was necessary to have recourse to bark. This remedy in remittent bilious fevers, is seldom uncommonly disgusting to the patient; for although the stomach is very often irritable in these fevers, and consequently incapable of retaining the bark, yet the patient seldom expresses any dislike to swallowing it. In this fever, however, this medicine was extremely disagreeable to the sick, and the irritability of the stomach at the time it became necessary, was so great, as very frequently to baffle every attempt to render it retentive. Nature seemed to point out the impropriety of administering the bark, by not only rendering the palate abhorrent to it, but exciting such a degree of spasm in the stomach, as made that organ totally unequal to even the reception of it. Hence we are not to be surprized that the bark did so little in this fever. In fact, except in some of the third class of patients, it was not a medicine to be depended on; and, even, in these the suc-
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cess was obtained chiefly by the agency of other medicines in restoring some degree of tone to the stomach. My friend, Dr. John Stewart, of Grenada, thus stated to me, by letter, the result of his practice in this disease with bark, on which, he then, 1793, chiefly depended. "The fatal symptom in my practice has uniformly been a comatose affection, sometimes preceded by delirium, which in most cases had a great resemblance to a state of inebriation, attended with a constant desire of getting up and walking about if permitted. I have never witnessed a second paroxysm of fever; and what appears to me extraordinary, is, that after the removal of it by early evacuation, by vomit and stool, the patient has appeared quite in a convalescent state, without any complaint remaining but a sense of pain and soreness over the body, and a degree of weakness; notwithstanding which, the bark has, in some instances, been pushed the length of 10, 12, and 16 ounces, not a dose thrown up; but sorry am I to say, without having the smallest effect in preventing the affection of the brain and a fatal issue." This remedy was not more efficacious in the hands of Dr. Rush. Speaking of bark, wine, and blisters, he tells us, "none of these remedies appeared to be of any service; for although three out of thirteen recovered of those

to whom they were applied, yet I have reason to believe that they would have recovered much sooner had the case been trusted to nature." These remedies, conjoined with the cold bath, were equally unsuccessful. " Three out of four of my patients died to whom the cold bath was administered, in addition to the tonic remedies before mentioned."* The bark has been found to be dispossessed of any efficacy in the fevers of Bengal. To this the testimony of Dr. Wade is very strong and pointed. " It must be acknowledged, however, says he, to the credit of the Honourable Company's medical servants in Bengal, that it (the bark), holds not such unbounded possession of practice in its improved state in that country; yet the prejudices in its favour are still such, as to render it on many occasions an active poison, to the destruction of numbers."†

SECTION VI.

Antispasmodics.

I HAVE in the chapter on the use of mercury, endeavoured to point out the most effectual

* Account of Yellow Remittent Bilious Fever, p. 194 and 196. Med. Inq. and Obs. vol. iv. p. 98.

† Paper on the Prevention and Treatment of Disorders, &c. in Bengal, p. 58.

means, I am acquainted with, of restoring tranquillity to the stomach in its spasmodic state, in the malignant pestilential, and yellow remittent fevers. I shall here offer such further observations as occurred to me on this important subject.

The thebaic tincture will always be a good addition to the bark, when it is judged proper to administer that remedy. It has also, given in draughts, and frequently repeated, been of service as an antispasmodic ; but solid opium, so often useful in other fevers, attended with irritability of stomach, was, in these, seldom beneficial : whether it is, that the opium has been discharged before any part of it could be dissolved ; or, that the tone of the stomach and intestines being suspended, it has passed off without their being affected by it. Burnt ardent spirits seemed to give a momentary relief ; but it was merely momentary ; nor had a repetition of them a similar effect, for they were then, instantly rejected. Blisters, I have already observed, did almost no good in this way. Tincture of bark, or a very strong infusion of it in port-wine, was sometimes useful. During the prevalence of the pestilence in 1793 and 1794, I found the vitriolic æther the only medicine, in any degree, truly and permanently beneficial in enabling the stomach to re-

ceive and retain the bark, or in restoring it to a state of tranquility. Several cases fully evinced this; and a few occurred in my practice, wherein the cure seemed to be completed by this medicine alone. The case of John Chevers, which I have subjoined in the appendix, is one illustration of its efficacy. In the first edition of this work, I observed that the only writer I had met with, who recommends the use of æther in malignant pestilential fevers, was M. Poissonnier; and my reason was, my not having adverted at that time to Dr. J. C. Smyth's paper on the Use of the Sp. Vitrioli Dulcis in Fevers. This gentleman has supposed, from this circumstance, that I had never read the "Medical Communications," or did not imagine that æther, and the spiritus ætheris vitriolici were in fact the same medicine.* I am sorry it did not occur to me to quote this authority, as well as that of M. Poissonnier, for whilst I stated the benefit which Dr. Smyth has conferred on the public, by the recommendation of this excellent remedy, I should have had occasion, at the same time, to record the efficacy it had been found to possess in the cure of the malignant sore throat and common remittent fever at Grenada, after the introduction of the first vo-

* Description of the Jail Distemper, p. 163 and 158.

lume of the Communications in 1786, into that island. Dr. Smyth informs us, that “ the cases of all others, to which it, the spiritus vitriol. dulc. seems the most peculiarly adapted, and where he has seen it produce the most sudden and surprising effects, are those fevers occasioned by contagion, or what are called the jail or hospital fevers.” M. Poissonnier gives æther a character equally applicable to the present occasion : “ C’est dans ce cas-ci surtout qu’on peut proposer avec confiance quelques petites doses d’ether vitriolique sur du sucre, à fin de combattre plus efficacement la pourriture, et de rétablir le ton de l’estomac, et de toutes les parties. Ce remede ranime sans être incendiaire, et semble devoir remplir ici la double indication de soutenir les forces de la nature, et de s’opposer à la putrefaction des humeurs. Je fais qu’à la Cayenne, où une maladie à-peu-près de cette nature, a enlevé les quatre cinquiemes des personnes qui étoient passées dans cette colonie, plusieurs malades réduits à l’extrémité, ont dû leur guerison à l’usage qu’ils ont fait de ce remede, et qu’ils prenoient même en assez grande quantité.”* These ample testimonies were sufficient encouragement to try it in

* *Maladies des Gens de Mer*, tom. i. p. 351. See also something to nearly the same purpose in “ *Observations sur les Maladies des Negres*, par M. Darille, p. 49.

a malady that had hitherto resisted all the means usually resorted to. The event justified the practice. I gave the æther in the following manner. The patient being allowed to remain undisturbed about an hour, I gave him about a tea-spoonful in half a wine glassful of cool water. After this he continued undisturbed about two hours, when the dose was repeated. At the expiration of another hour, the bark was offered him ; and if he swallowed and retained it, the æther afterwards was given only once in five or six hours. But as this very seldom happened, it was generally necessary to repeat the æther in the same quantity every three hours, till the spasm of the stomach was entirely overcome. Æther given in the manner I have mentioned, is extremely grateful to the patient ; it occasions an agreeable warmth along the œsophagus, and gently stimulates the stomach. This effect, however, does not continue long ; but the frequent production of it, at length, gives it a permanency. It appears to act as a tonic, an antiseptic, and an agreeable stimulant ; a warm glow overspreads the surface, and thirst, nausea, and oppression, have not unfrequently fled before it.

Since the year 1793, this medicine has been very generally used in the malignant pestilential, and yellow remittent fevers, by most practitioners

in the West Indies, with various success. The nature of these fevers, and the dreadful violence of the symptom, the medicine is principally opposed to, must have necessarily, in a very great number of cases, rendered it ineffectual: but there has been another cause which has tended nearly as much to this want of efficacy, and that is a want of perseverance in, and an improper application of, other remedies at the same time with the use of the æther. It has, unhappily, not always been attended to, that the most active remedy cannot instantly produce the expected effect, nor, by one or two exhibitions, bring about a change which requires reiterated trials.

SECTION VII.

Tonic Injections,

I HAVE generally, during the exhibition of the æther, and till the stomach became retentive, ordered bark to be administered in the form of injections. With respect to injections of bark in general, a great deal cannot be expected from them. In the disease before us, when the case was of the more violent kind, the spasm which affected the stomach, seemed to prevail more or less throughout the whole length of the intestinal

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canal, consequently the injections were almost always immediately voided; or, if they were retained, so little of the antiseptic part of the medicine was absorbed, as to be totally inadequate to combat the rapidly increasing gangrenous disposition. In a state of the intestines so highly morbid, the action of the absorbents must have been imperfect; or if, with Dr. Cullen, we consider the operation of the bark as arising merely from a tonic power, the spasmodic state of the intestinal fibres must have prevented any efficacy from its application to them. But as the tonic power of this medicine could alone be efficacious, I did all in my power to obviate the spasm, by antispasmodics, by distention of the colon and rectum, and by the addition of port-wine to the bark. The antispasmodics I used were, opium in watery solution; asafoetida, and camphor, rendered soluble in water by mucilage; but I derived very little benefit from any of them. The most useful was the opium, of a strong watery solution of which, I generally added two tea-spoonfuls to an injection composed of an ounce and an half of bark, and eight or ten ounces of water moderately warm, or of strong chicken-broth or beef-tea. This injection was repeated day and night, every three hours; and, if uniformly retained, a laxative injection was administered

ministered once in the twenty-four hours, to carry off the accumulated bark, which, otherwise, gave the patient considerable uneasiness. With a view to overcome the spasm by distention, I had a pint and a half of the above mixture injected into the rectum, and ordered an assistant to compress the anus with some degree of violence, by means of a towel well rolled up, the instant the pipe of the syringe was withdrawn. This sometimes succeeded, when the patient could be prevailed on to lie quiet in one posture; but, in most cases, the patient being comatose, delirious or restless, from the general uneasiness and oppression which then prevailed, it could not be put in practice.

The total inability of the stomach to receive either medicine or nourishment in many cases; and the inefficacy of the bark-injections described; at length, induced me to use port-wine, as the most restraining, instead of water, chicken-broth, or beef-tea. As the practice was not warranted by any medical authority, I confess it was after some hesitation I ventured on it; and my hesitation arose chiefly from a fear of the irritation which the wine might occasion when applied to the tender surface of the intestines; and, in a healthy state, perhaps very untoward symptoms might be the consequence. But, in the present

morbid state of the viscera, so far from its producing irritation, I found it a most useful, and not unfrequently a very efficacious practice. To two ounces of bark, I added as much port-wine, as rendered the mixture sufficiently thin to pass through the pipe of the syringe, and after adding the usual proportion of the solution of opium, had it administered every three hours, taking care to use a considerable degree of compression on the anus for some time after, to prevent its being soon passed. Although this medicine was by no means always effectual, in stopping the progress of the gangrenous disposition, yet it was infinitely more so than any other antiseptic combination used in this way, when the stomach did not admit of the exhibition of bark in any other manner. Perseverance, however, was absolutely necessary, in order to produce the desired effect; and it was also equally necessary to leave the stomach undisturbed, as long as any irritation remained in it.

Since the period at which the foregoing opinions were formed respecting the unaptness of this remedy to the state of the body during the presence of the malady, and the tendency it produces, or increases, to the formation of a gangrenous disposition, have become so obvious, that few practitioners of observation and judgment,
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and still fewer who feel themselves free to think for themselves, ever admit it into their practice, but under certain obvious circumstances. The same unfuitableness has become also apparent in the yellow remittent fever, in which it once unhappily constituted the principal remedy, and it is therefore very properly rejected in the treatment, except during the convalescent debility, to give place to mercury. I may also add, that its applicability to the febrile diseases, in general, of hot climates, is very much circumscribed, since the shackles of theory, and early prejudice, have been thrown off: since the empire of common sense has reassumed its sway: and since the ridiculous habit of prescribing bark to a patient, merely because he labours under a disease which has been named a putrid or malignant fever, has been, in a great measure, discarded from the practice of medicine in the West Indies.*

* Dr. Moore, with much good sense, and in the vein of humour peculiar to that excellent writer and observer of mankind, has observed, " names have no influence on a judicious and experienced physician, who carefully examines symptoms, weighs every concomitant circumstance, and forms his treatment accordingly. But there are practitioners who pay more regard to the name, than to any other circumstance of the disease; only be so obliging as to furnish them with that, and it is all the information they require; let it be inflammatory fever, nervous fever, hectic fever; be what it will, they consult the last new practice of physic, and give you a prescription directly." *Medical Sketches*, p. 341.

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SECTION VIII.

Russian Method of treating the Plague, modified.

FREQUENTLY baffled in my endeavours to fulfil the second indication of cure, by the exhibition of bark in the forms I have described; and often induced, from many of the symptoms, as well as the general character of the disease, to consider it as a plague or pestilence: I had, in a few cases, recourse to the practice described by Dr. Guthrie, and said by him to be uncommonly successful in the treatment of the plague by the Russian physicians. I followed it exactly, with the exception only, that the dread of producing or increasing irritability, prevented me from repeating the emetics so frequently as recommended by the Russian physicians. The result of this practice is stated in the table inserted in the second chapter of the first part; from which it appears, that as the number of unsuccessful cases was exactly equal to the recoveries, the encouragement to proceed was not very great. One of the patients, treated in this way, Martin Grey, a soldier of the royal artillery, had been apparently cured by mercury, without its producing salivation; but, having relapsed, I put him on this course. After a flattering, but momentary change
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on the fifth, he died on the seventh. Another of the same corps, Richard Duckett, had recovered in the same manner, by means of mercury, but relapsing, he was treated in this method, and recovered. The difference of result, in circumstances exactly parallel, in other respects, must have arisen from the former being a recruit just arrived from Europe, the latter nearly three years in the climate.

It may not, perhaps, be considered as foreign to my subject to remark here, that, in the furunculus, which prevailed very generally almost immediately after the malignant pestilential fever had abated, about the end of August or beginning of September, I found the combination of bark and sulphur, which forms part of the Russian plan, a most excellent remedy in increasing the eruption, and promoting the suppuration. These furunculi, or, as they are commonly called, blind-boils, were very large, seldom less than an inch in diameter, very painful, and discharged a very uncommon quantity of purulent matter. They appeared on every part of the body, but in greatest number near the scrotum, the hips, and on both upper and lower extremities.

SECTION IX.

Angustura Bark.

WISHING to leave nothing untried that promised any relief to my patients in this fatal malady, I determined on trying what the *Angustura* bark would do. On a former occasion,* this bark

* *Med. Commentaries*, d. 2, vol. viii. p. 490. In the first part of the first volume of the *Transactions of the Natural History Society of Copenhagen*, published in 1790, by M. Suhm, there is a valuable paper by the celebrated Botanist Professor, Martin Vahl, on the various (nine) species of cinchona. The first species, or the official cinchona, of Vahl, is the true quinquina of Condamine, (*Memoires de l'Academie des Sciences*, 1738) and is the official of Linnæus, (second volume 10th edit.) which, however, afterwards (in his 12th edit.) he changed for what Vahl makes his third species, the macrocarpa, owing to a mistake in the information Linnæus received; and this mistake has continued through the two subsequent editions. The official of Professor Vahl is the true Peruvian bark; and the specimen, he describes from, was communicated to him by M. Jussieu, and is a native of Loxa. M. Vahl had his specimen of the macrocarpa from M. Ortega; but the species was first discovered, and brought to Europe, by M. Mutis, from the mountains of New Grenada, in the neighbourhood of Santa Fé de Bogota, in South America: and from him the Professor had also a specimen, and the information which has induced him to differ from Linnæus in the arrangement and name of it. It was the opinion of the late Colonel Van Rohr, an excellent and indefatigable Danish Botanist, of the island of St. Croix, who had been in the neighbourhood of Santa Fé de Bogota, that the cinchona macrocarpa, of Professor Vahl, is the true *Angustura* bark;

bark seemed useful in an irregular fever depending on local disease. Since then I have read Mr. Brand's "Experiments and Observations on the Angustura bark," wherein its efficacy as an antiseptic, and tonic, are highly commended in various states of fever. Encouraged by these, and perceiving that this bark possessed a pungency or spiciness, a quality which the Peruvian bark had in a very inferior degree, I made use of it, in expectation that, by gently stimulating the stomach, and thereby obviating the spasm with which that organ was affected, it might have a better chance of being retained. I did not begin to use this

bark; and one reason which he offered for this opinion, was his having seen a parcel of bark, which was brought from that place down the River Magdalena, and which, on inspection and tasting, he found to be the same as the Angustura bark so called. The river Oroonoko, on which is situated the town and province of Angustura, has its source in the mountains of Grenada, on which the *cinchona macrocarpa* grows, and hence may have on its banks the same production. The botanical character of the *macrocarpa*, given by Professor Vahl, is the following: "*Calyx campanulatus. pubescens, intus sericius, quinque dentatus: dentibus obsolete, acutis. Corolla coriacea, sesqui pollicaris, pilis minutes ad pressis tomentosa. Limbi laciniae lanceolatae obtusae, longitudine tubi. Filamenta brevissima. Antherae lineares faucem parum superantes. Capsula cylindrica, bipollicaris, glabra, basi parum angustior. Valvulae dissipimenti basi apiceque sinu magis hiantes*" I am indebted for the perusal of the above book, and for the rest of the foregoing particulars, to my learned and excellent friend, John Ryan, of St. Croix.

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remedy till towards the end of July, 1793, and gave it only in twelve cases. Five of these were soldiers of the royal artillery ; and the remaining seven, inhabitants and transient persons. The former recovered with wonderful rapidity, and three of the latter, so that only one in three died. Although the success was greater than I expected, I did not think myself justified in trusting altogether to the Angustura bark, when I was possessed of a remedy more certain in its effect, and of whose safety, extensive experience had fully satisfied me. From the event, however, it was evidently a more suitable medicine than the Peruvian bark. Three of the five of the artillery, who took the Angustura bark, were young men, who had never entered the torrid zone before, and were almost total strangers to the climate ; and those who died were sailors, who had only lately arrived from Europe. No doubt peculiarities of constitution, and a greater degree of predisposition, had a large share in producing this difference of effect, in persons otherwise similarly circumstanced : but it was evident also, that though frequently an useful medicine, and although it generally agreed with the stomach, the Angustura bark was by no means to be safely depended on in cases of great violence. I always preceded the administration of this medicine with

evacuants;

evacuants ; and, after their operation, I gave a scruple of the powder of it, mixed with water, every hour, or two scruples in three hours. In the eight cases, wherein this practice was successful, I was astonished to see an almost immediate change take place ; for, instead of the heat being increased, and the surface becoming dry, which too often followed the too early use of the Peruvian bark, an agreeable glow, an increase of warm sweat, and a diminution of pain, were the consequences. For instance, if the patient was seized with the usual symptoms in the evening, I had the solution of salts and tartarized antimony immediately administered in the manner already described. These having operated sufficiently during the night, I began the use of the Angustura bark in the morning. By the following evening, all the symptoms were relieved ; and, on the second morning, the patient was up, walked a little, and had some appetite ; and from thence, using occasionally the Angustura bark, he continued to recover. How different this from the effect of the Peruvian bark ; nausea, vomiting, morbid heat, dry skin, quickened pulse, increased pain ; often succeeded by coma, delirium, &c. ; and seldom administrable without æther.

SECTION X.

Cold Bathing.

DURING the prevalence of the malignant pestilential fever in 1793 and 1794, I made no use of the stimulus of cold in any form whatever: but the observations I made after my return to the West Indies, and the communications I have been favoured with, have satisfied me that it is a remedy possessed of considerable efficacy in certain circumstances of both the malignant pestilential and yellow remittent fevers. When I first began the use of cold bathing in these fevers, I conceived that the only periods at which it exhibited its beneficial powers, were the commencement, or rather before the fever is formed, and the low state, when the mercury has had no effect, and when the gangrenous disposition has begun its approaches. Whilst this was my idea, I confess I could not satisfy myself with any reasons why its operative effect should be confined to these periods. I could readily account, indeed, for the advantages derived from its early exhibition, by supposing the excitement of a new action sufficient to overpower the morbid action before its establishment; and the stimulant powers of cold, clearly elucidated the benefits arising

arising from the application of it in the low state. But has not cold a sedative power also? And if it has, why may it not be applied to diminish morbid heat during the first stage, or the inflammatory state? Authority, not experience, led me to avoid the trial; and such reasoning as the following confirmed my apprehension of danger from it.—If we suppose that the operative effect of cold is the production of a new action, which in one instance prevents, and in the other resists, that of the remote cause, how are we to expect, by it, the removal of an inflammatory diathesis, which stimuli have already excited? This is specious, but, like most reasoning founded on theory, or badly ascertained facts, it is also fallacious.—The ingenious and penetrating Dr. Currie, of Liverpool, first drew the veil aside, and exhibited the nature and cause of the fallacy. Defective observation and total ignorance relative to animal heat, in an healthy and in a morbid state, I was convinced, with him, were the true causes that cold bathing had hitherto produced but very partial benefits in the West Indies, during the inflammatory stage of fevers in general. Unfortunately, however, this conviction came too late to be usefully pursued and illustrated in my practice. To what little I have observed I shall give a place in the Appendix (Appendix 7th);

and add what confirmation to the doctrine of Dr. Currie has resulted from the observation of the very few of my friends who have applied themselves to the elucidation of it in the West Indies.

During the inflammatory state, although no attempt on rational principle was made to counteract the prevailing diathesis, yet particular symptoms were considerably alleviated by the application of cold. Thus, then, as a preventive, and as a tonic, cold was generally ; as a palliative of distressing symptoms, it was partially applied.* Dr. Davidson, of St. Vincent, formerly has, I believe, the merit of being the first medical practitioner in the West Indies, who experienced in his practice the preventive efficacy of cold bathing in the early periods of the yellow remitting

* Dr. Currie has demonstrated that cold affusion is not only possessed of a sedative, but of a stimulant or tonic power. "The stimulating action of cold, though short in duration, is powerful in degree. In the torpor of convulsion, when weaker stimuli are unperceived, the affusion of cold water on the naked body will often excite the dormant sensibility, and introduce a new action throughout the nervous system. It is the stimulant power of cold that renders it so difficult to employ it in inflammatory diseases." I received Dr. Currie's valuable book from England in the year 1798, a considerable time after this part of this work was sketched ; and it was with no uncommon satisfaction I perceived my own sentiments adopted and applied by this judicious physician. His reasoning is pursued afterwards, p. 218. See also part II. ch. 4, sect. 6, of this work.

fever:

fever: and during the prevalence of the malignant pestilential fever at St. Vincent, in 1793, he frequently recurred to it with that intention. It has since been frequently employed by other practitioners, with this view, and with various success. The most efficacious mode of employing this practice is to produce a succession of shocks, heightened by the interposition of warm water. Thus the patient being placed in a bathing tub, his person is washed with warm water, and, whilst the sensation of heat is still perceived, a bucket or pail or two of very cold water, is dashed on his head and shoulders, from some height, so as to augment the stimulus to the utmost possible degree. Warmth in the same manner is again applied, sometime after, and succeeded by cold. Whilst this alternation of relaxation and stimulus is used, evacuating medicines are advantageously employed.

The employment of cold bathing in the malignant pestilential fever, with the intention of giving strength and tone to the system, and facilitating the action on it, of the mercury exhibited, was originally suggested by the total unaptness of bark wine and other tonics to produce this effect, whilst the rapid advance of a gangrenous disposition gave little prospect of a happy termination without a salivation. Every one

acquainted with the received doctrine of the “modus operandi” of mercury, and with the prejudices which have existed against the application of cold to the body, in any form, during the exhibition of that medicine, will doubtless acknowledge that no small share of fortitude, and disregard of popular opinions, distinguished the practitioner who first adopted the practice. Dr. Armstrong, of St. Kitt’s, has, I believe, the merit of an innovation in medical practice, which must terrify timid practitioners; and which, being so completely opposite to all theoretical notions with respect to the combination of cold and mercurial action, must startle the boldest physicians of the old school. The manner in which the cold bath is employed with this intention, is as follows: The mercury is exhibited in the manner already described, till a ptyalism is excited. Should any doubt, however, arise of its producing this effect, recourse must be immediately had to the cold bath; which is to be administered repeatedly in the course of the day, by dashing over the naked body of the patient a large pailful of cold water; and, wiping him dry afterwards, as quickly as possible, he is laid in bed, covered with a single sheet, and a glass of spiced wine given to him. Where this practice has been employed with judgment, assiduity and

attention,

attention, the effect of it in exciting mercurial action, has been wonderfully great; nor, under such circumstances, has it once failed. Much has been said against the application of cold water to the body, in the low state of the malignant pestilential and yellow remittent fevers; but whilst writers have manifested their disapprobation of it, they have forgot to point out any more powerful remedy; and they have forgot that no tonic whatever can be efficacious in these fevers, but so far as they augment the general strength, and restore it to that state which secures the action of the appropriate remedy, and tends, by its operation, to the destruction of that pernicious chemical combination which, it is supposed, constitutes the basis of the remote cause. Much has also been said against the efficacy of the cold bath conjoined with the exhibition of mercury: but there is too much room to suspect, that the cause of efficacy has been wanting—that judgment, that assiduity, and that attention, which can alone secure success to the most efficacious and appropriate treatment.*

Attempts

* How few of the medical gentlemen who practise in military hospitals, or even in a more private circle of practice, can prevail on themselves to watch those changes in the fevers of a tropical climate, which indicate the application or the avoiding of the affusion of cold water. How few even observe the changes which

Attempts have been made, and not unfrequently successful ones, to relieve the head-ach, to obviate the irritability of stomach, to lessen the sensation of internal heat, to stimulate the intestinal fibres, and to derivate from the vital organs, by the partial application of cold. A solution of muriated ammonia in water applied to the forehead by means of linen cloths soaked in it, and frequently renewed, has often given considerable ease to the patient. Vinegar, vinegar and water, and nitre dissolved in vinegar, and cold water alone, made use of in the same manner, have produced an effect nearly as salutary. The solution of ammonia, or of nitre, has also been employed to obviate the irritability of stomach; and, I understand, for I never used it myself, with a singularly good effect. As far as I know, this application to the gastric region has been employed by only one practitioner, Dr. Noble, of St. Christopher's; but the abilities and

take place in the temperature of the atmosphere! How painful, then, to such must be the ascertaining, by a thermometer, the degree of animal heat! The standard heat of the body, in health, is the point to be obtained: if the thermometer indicates a heat below or above this, the body must be deranged—in the first stimulants, in the second sedatives, are required. What mischief must attend the indiscriminate application of cold! In the height of a paroxysm, it instantly checks, and perhaps prevents, the return of morbid heat—during the diaphoresis, in which the paroxysm terminates, it increases debility, and tends to renewal of morbid heat.

veracity

veracity of that gentleman give a stability to the observation, which holds out encouragement to further trials of it. Clysters of cold water, and of common salt dissolved in water, have been frequently used, and, I believe, in many instances the indication which directed to the use of them, has been fulfilled. And bathing the feet in cold water has had frequently the agreeable effect of relieving the head, the oppression at the præcordia, and the general heat.

Dr. Rush bears testimony to the advantages which may be derived from the judicious application of cold water; but these advantages, as observed by him, were, I believe, confined to the relieving particular symptoms, or to the prevention of the disease. Dr. Seaman, of New York, employed it also with the same view.*

Dr. M'Lean thus speaks of cold bathing:—
 “ The beneficial consequences from cold water seem to me to arise entirely from a revolution it produces in the given state of the body, by which the whole morbid phænomena are changed. In the very early stage of fever, before it has established its peculiar mode of action, before the re-action begins, I think the

* Account, &c. p. 287. Med. Inq. and Obs. vol. 4, p. 91.
 Webster's Collection of Papers, &c. p. 45.

practice of dashing cold water on the patient may be very useful. But after the fever has established its peculiar morbid action; after the circulation and vessels re-act; after determinations to particular organs have begun, I hold the practice less certain. Because it is not likely to banish the mode of acting then fixed; and the sudden energy of the vessels from so powerful a stimulus, may assist determinations, and promote an inflammatory disposition. Previous evacuations may perhaps guard against these mischiefs. In cases where sensibility is much impaired, where the recollection is confused, where the system is, at it were, oppressed, and wants energy to remove the compression, where the pulse is feeble and frequent, in such cases I hold the dashing of cold water to be one of the best and most powerful remedies." He afterwards qualifies the remark, by informing us, that "it must not be concealed that I have used it often without success, in cases where I promised myself much from its use. I have not at times been able to observe, that it produced any great effect. We have yet much to learn from experience on this subject."*

* An Enquiry into the Nature and Causes of the Mortality at St. Domingo, p. 151, 152.

Dr. Wright, who may be justly considered as the father of this practice in the West Indies,* in his MSS. Report to the Army Medical Board, thus delivers his opinion of its use in the yellow fever: "In the beginning of yellow fever, the cold bath succeeded admirably, as in other varieties of typhus; but in the advanced stage much caution was observed in this respect. However, some lucky expedients have been practised, which success only could justify; and that was when the most urgent symptoms were subdued, the patients were wrapped in a wet blanket, a profuse sweat was brought on, and an immediate recovery was the consequence."

It is a curious fact that mankind, in an uncivilized state, or when they are obliged to resort to those means of relief from the maladies they may be afflicted with, which an instinctive impulse, or an intuitive perception, unaided by reason, suggest to them, employ the stimulus of

* See the ingenious Paper on this subject, by Dr. Wright, in part 2d of the London Medical Journal for the year 1786, in which he dates his first adoption of the practice of cold bathing in malignant fevers as far back as August 1777. See also Practical Observations on the Treatment of Acute Diseases, particularly those of the West Indies, in 7th vol. of Med. Facts and Obs. If Dr. Wright is not the first practitioner who adopted cold bathing in acute diseases, particularly fevers, he is at least the first who has communicated to the public the result of his observations on the practice.

cold in the cure of fever, heightened by the previous application of heat, to a degree which men, in a cultivated state, probably, are incapable of supporting. Thus the Indians of America, having excited by hot aqueous vapour, a most profuse perspiration in the person of the sick, apply the stimulus of cold, by suddenly plunging him into cold water. Thus, too, the Russians, about the beginning of the present century, had recourse to a heated oven, in the first instance, in which they placed their patients labouring under fever, and having shut the door, in such a manner as almost prevented them from respiring, they continued the heat, only permitting the occasional admission of external air, till they were almost roasted. Having produced the degree of heat required in the persons of the sick, they were instantly plunged into a river; or, what they liked better, they were covered with snow, and remained in that state for a time proportioned to the violence of the disease.*

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* As the fact is an extraordinary one, I shall transcribe the original. “ On chauffe un four à l'ordinaire, et quand la chaleur est un peu abattue, cinq ou six Moscovites, plus ou moins, s'y glissent et s'y étendent tout de leur long; après quoi on ferme la porte sur eux, de manière qu'ils peuvent à peine respirer; lorsque la chaleur leur est devenue insupportable, ils sortent pour prendre le frais, et rentrent ensuite; ils recommencent jusqu'à ce qu'ils soient presque-entièrement rotis: ils en sortent enfin, rouges comme des écrevisses,

If we may rely on the authority of M. Savary, the plague itself seems to yield to the application of cold. This agreeable writer says, " I must lay before you a fact, which was related to me by a Captain worthy of credit, since it may furnish some light to physicians, who are seeking for an antidote against this destructive scourge. ' I left Constantinople, where the plague was raging. My sailors had contracted the epidemic disorder. Two of them died suddenly. In taking care of them I caught the infection. I felt an excessive heat, which made my blood boil. My head was

vissés, et se jettent dans la riviere; ou, ce qu'ils aiment encore mieux, ils se couvrent entièrement de neige, et demeurent ainsi enveloppés plus ou moins de temps selon la maladie." On the authority of the *Nouveau Memoires sur l'état présent de la Grande Russie*, and the *Memoires de Trevoux* for August 1725, this fact is inserted in "*Anecdotes de Medicine*," tom. 1, p. 20. Can the success of this process be accounted for on chemical principles? When composing this work I was deprived of the advantages of consulting the writers quoted by Dr. Currie, on the Russian method of applying cold and heat alternately, so as to give more efficacy to the former. According, however, to Dr. Currie's authorities (p. 125), heat is applied by means of a bath heated to a degree varying from $106\frac{1}{2}$ to 116 of Fahrenheit's scale, and even to 160 in some instances. How far my authority may be relied on, I cannot determine; but as it relates the practice which prevailed in Russia before any considerable advances had been made to civilization, so we may, without violating credibility, believe that the Russian constitution has since acquired, by the introduction of softer manners, a degree of delicacy which renders such rough treatment incompatible now with the powers of the living principle.

very

very soon attacked, and I perceived I had but a very few moments to live. I employed the little judgment I had remaining to make an experiment. I stripped quite naked, and laid myself for the remainder of the night on deck. The copious dew that fell pierced me to the very bones. In a few hours it rendered my respiration freer, and my head was composed. The agitation of my blood was calmed, and, after bathing myself in sea-water in the morning, I was completely cured.* I do not know, Sir, whether this can be an infallible remedy, but I am certain, that all infected substances that have passed through water no longer communicate the poison.*

SECTION XI.

Essence of Spruce.

IT remains only to offer a few observations on the use of the essence of spruce in the malignant pestilential and yellow remittent fevers; a remedy from whose efficacy the highest expectations were formed, but which, I am concerned

* Letters on Egypt, v. 2, p. 255. M. Savary's last remark has been finely illustrated by Dr. Mitchell, the professor of chemistry at New York. See his letter to John Stevens, Esq. on the miscibility of contagious air with water.

to state, experience has proved to be almost altogether dispossessed of the virtues attributed to it.

The Board of Ordnance, justly alarmed at the unheard of mortality which took place in the Ordnance Department in the West Indies, and desirous of ascertaining the attributed *specific* virtue of the essence of spruce, in the fevers which occasioned it, transmitted instructions, directing immediate trials to be made of this remedy, and recommending the exhibition of it to be conformable to directions given by Captain Alexander John Ball, of the navy, in a letter addressed to the Commissioners of the Board of Sick and Hurt. The instructions from the Board of Ordnance were to the following effect :

Office of Ordnance, 5th October, 1796.

SIR,

IT appearing from several communications which have been made to Government, that the essence of spruce has in many cases been successfully administered as a medicine in the cure of the yellow fever, which has raged of late with so much violence in St. Domingo and several other of the West India Islands : The Master General and Board are anxious that its efficacy

cacy in counteracting a disorder so fatal in its effects should be fully ascertained, and have therefore directed that a certain quantity of the essence of spruce should be sent to Martinique, consigned to your care, which you are to have administered to such persons as may be infected with the yellow fever, in the manner pointed out in the inclosed letter from Captain Ball. And I am to desire that you will report to the Board the result of such trials as are made with it, as soon as you think they have been sufficiently performed to warrant your giving an opinion whether the essence of spruce possesses the *specific quality* attributed to it, &c.

(Signed) R. H. CREW, *Secretary*.

Captain Ball's letter referred to in the foregoing, is as follows :

Blackheath, 18th July, 1796.

GENTLEMEN,

I AM honoured with your letter of the 16th instant, desiring to be informed of the proportion of water mixed with the essence of spruce, given as a medicine for the yellow fever ; and in answer I beg leave to acquaint you, that a quart of boiling water was mixed
with

with three table-spoonfuls of the essence, and when cool, it was fit to drink. Three tumblers have generally effected a cure, and it will stay on the stomach when every other medicine has been rejected. When the patient is very bad, a wine-glassful should be given at one time; there have been instances of the first glass being rejected, but the second always remained. A seaman belonging to the Argonaut, who was violently attacked, did not eat any thing for four days, during which time he drank seventeen tumblers of this essence mixture. He was of a remarkably strong habit, about twenty-six years of age.

If there be much bile in the stomach, it acts as a strong purgative, but if the stomach is in a good state, the feverish symptoms gradually abate without any sensible operations.

I was attacked with the fever, and took two calomel pills, and endeavoured to keep them down by a pleasant lemonade, but without effect. I immediately took the essence mixture, and drank three tumblers of it in the course of three hours, without experiencing any sensible operation from it, and I recovered without confining myself to any regimen but that of general temperance, &c.

(Signed)

A. J. BALL.

To the Commissioners of the Sick and Hurt.

Such a testimony of the astonishing powers of the essence of spruce justly raised the most flattering hopes that at length a certain, a *specific* remedy was discovered for the malady which had hitherto resisted every means which skill and experience could suggest; and it was with more faith I relied on this representation of its virtues, from some fortunate trials I had made of spruce beer, about ten years before at Grenada, in the treatment of a remittent fever distinguished by a most distressing irritability of stomach. But in the present instance, whether the quality of the essence sent out to the Ordnance Hospital establishments was bad; or whether Captain Ball might not have been deceived, and assigned to the essence what should have been attributed to nature alone; or, finally, whether the disease, epidemic at St. Domingo, where the surprising cures related were effected, was of a milder nature than that which prevailed in the Windward Islands: whichever of these might have been the cause, it is certain that the exhibition of the essence of spruce in the latter was, in almost every instance, unsuccessful.

Several trials of it were made in the Ordnance Hospital at Fort Royal, Martinico, in the yellow remittent fever, but without any further effect than producing a momentary, and but a momentary,

mentary, cessation of vomiting; and, although assiduously persevered in, nothing permanently beneficial was the consequence. One or two slight cases of common remittent seemed to have derived considerable advantage from, and the patients themselves attributed their cure to, the essence of spruce. In the course of the year 1797, two trials were made at my request by Dr. Davidson, of the essence, but in both it failed. The last of these was instituted with a view to ascertain its comparative powers with calomel. Of twenty-one cases, sailors, labouring under the yellow remittent fever, twenty were treated with calomel, and one with the essence of spruce, in the manner recommended by Captain Ball. Seventeen of the former recovered, the latter died. In the month of June of the same year, a few cases of the yellow remittent fever appeared on board Admiral Harvey's ship, the Prince of Wales. My ingenious and valuable friend, Dr. Blair, physician to the navy on the station, directed trials of the essence of spruce to be made to obviate the vomiting, but without effect. The greatest part of the sick, however, recovered, by the bold exhibition of calomel. Dr. Fletcher, physician to the forces, who directed, with great credit to himself, the hospitals of the line, at Fort Royal,

made many trials of the essence, but without the expected success. Several trials, equally unsuccessful, were also made in the naval hospital, under the direction of Mr. Gillespie. At Grenada, Mr. Campbell, the ordnance surgeon, exhibited the essence of spruce in seven cases of the malignant pestilential fever. The patients were sailors, and consequently unfavourable subjects; but he assured me that, without the combination of calomel, or any other medicine, four recovered. Encouraged by this success, he administered the same remedy in the same manner, in several cases afterwards, but not one recovered. It is evident from the result of all these trials in the malignant pestilential and yellow remitting fever, that the essence of spruce is a remedy by no means to be relied on; that the utmost that can be expected from it is a temporary check to the vomiting; and that in slight cases, in which nature, unaided by art, may effect a cure, the good effects observed to result from it are at most equivocal.*

SECTION

* The short history of this remedy at St. Domingo, by Dr. M'Lean, leads us to conclude that a kind of *patchinage* gave rise to the fame it acquired there. The master of an American vessel ingeniously contrived to insinuate and to propagate a belief that spruce beer

SECTION XII.

Carbonic Acid Gas.

THE inefficacy of the tonic powers of bark and wine has suggested the use of the carbonic acid gas in many instances of the yellow remittent fever, and I am assured with considerable success. Whether it is on the possession of this acid, the supposed beneficial administration of the essence of spruce depends, I know not; but it is probable, that if any success had attended the use of this remedy, it must have resulted from its imparting some portion of the carbonic acid to the system. Dr. Davidson, of Fort Royal,

beer possessed a specific virtue against the yellow fever, in order to disembarraß himself of a cargo of the essence, which otherwise he might probably have found heavy on his hands. The cheat was not a very pernicious one; although we perceive that the credulity extended far beyond the limits of ignorance, and the circles in which it was first promulgated. Smith was universally and implicitly believed, and soon disposed advantageously of his cargo of essence of spruce. Enquiry, &c. p. 291. Something similar, I am informed, happened at Fort Royal, Martinico, in 1793, when the yellow remittent fever proved so destructive to the crews of the shipping in the Carenage. A man of the name of Duck imported a large quantity of the essence of spruce, and disposed of it very profitably by propagating false representations of its efficacy. The consequence, however, was fatal to a multitude of credulous seamen.

thus states the result of this practice with him :
 “ I have tried the effects of fixed air in clysters. I put a quantity of chalk and water into one of Mudge’s inhalers, and then carefully screwed all the joints. I put through the small aperture where the cork is left, a small quantity of vitriolic acid undiluted, having previously introduced the ivory nozzle of the flexible tube into the anus. A considerable quantity of air was extricated, and passed into the rectum ; the abdomen was sensibly inflated, and the patients mentioned their feeling it pass up. I gave at the same time effence of barm, a quantity of which I had by me, by the mouth. It is true, I also gave the bark ; and in one case, where there was a want of evacuation, and clysters did not procure it, I was obliged to give jalap and calomel in considerable quantity. Two out of three have recovered. In the unfortunate case, it was tried too late ; petechiæ, vibices, and an universal jaundice, having appeared before I thought of trying the remedy.” The only other medical gentleman I have met with who has adopted this practice, is Mr. Muttleberry, then (1798) surgeon to the 59th regiment, now garrison surgeon of Antigua. This very ingenious gentleman employed water impregnated by Nooth’s machine, in only
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one case of yellow remittent fever, a soldier of the 59th regiment. The indolent state of the patient's system, and the consequent inefficacy of calomel, were the motives which induced him to try the carbonic acid gas; and the success of the experiment has been such as encouraged him to prosecute the trial further.

CHAP. III.

The third Indication.

HAVING thus offered the most important observations I have made in endeavouring to fulfil the two first indications of cure of the malignant pestilential fever, I shall treat of the third, viz. to restore tone and energy to the system, when the patient is in a state of recovery. Change of air and situation, and suitable diet, were the means I found most useful; for, contrary to most febrile diseases, bark was here, either useless or hurtful; and, as I have already remarked, the patient seemed instinctively to reject and loath it.

SECTION I.

Change of Air and Situation.

As long as the patient remained in the infected room or house, although all symptoms of the disease had disappeared, the progress of his recovery was remarkably slow. And here I may also observe, that his restoration to health seemed

seemed to bear a pretty exact proportion to the means used in overcoming the disease. Head-ach; a heavy dull eye, with a considerable protusion from the orbits; low spirits, thirst, and a total want of appetite, were the general consequences of the treatment with bark, without the previous use of deobstruents, and the appropriate antiphlogistic. None of these unpleasant feelings attended convalescence, when the disease had been removed by mercurials; and I had frequently reason to imagine, that a serous accumulation continued in the brain a considerable time after the disappearance of the disease when treated in the former way. Nor in this observation have I been singular. Dr. Rush has confirmed the justness of it; and judiciously remarks, that “should the immediate success of tonic and depleting remedies in destroying the fever be equal, the effects of the former upon the constitution cannot fail of being less safe than the latter remedies. They cure by overstraining the powers of life. There is the same difference, therefore, between the two modes of practice, that there is between gently lifting the latch of a door, and breaking it open in order to go into the house.”* Compression was indeed evidently in-

* *Inq. and Obs.* vol. 4. p. 100.

licated by the appearance of the eyes, the continual headach, a frequent nausea, and a tendency to stupor and sleepiness; and as no means were used, during the presence of the disease, to excite an absorption of the exhaled fluid in the brain, it was highly probable that the compression arose from this deficiency. The same observation was made at Philadelphia, and I have little doubt the symptom proceeded from the same cause, as much as from the continuation in the system of a portion of the contagion.* Although nothing of this kind followed the mercurial plan, extreme debility was the immediate consequence of the disease in all cases. But there was this distinction observable, that convalescent debility was of much shorter duration after treatment with mercury, than the other. It appeared that the infected air of the room, in which the patient continued to reside, although it could never renew the disease, stimulated the stomach in such a manner as to produce an effect almost equally dreadful.† To obviate this evil, a change
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* Account of the Bilious Yellow Remittent Fever, p. 112.

† Dr. Russel on the subject of relapse says, "It is a prevalent opinion in the Levant, not confined to Aleppo, that irregularities of diet in the plague, before the expiration of forty days, are very apt to produce relapses characterised by new eruptions." This observation is borrowed from Timoni, Ph. Transf. vol. xxxi. "a peste convalescere

of air and situation became absolutely necessary the moment signs of convalescence appeared: and, indeed, of all the means I know of recovery from this state of debility, it is the most efficacious. Even the instant the patient was carried into the open air, he was sensible of a wonderful degree of refreshment; and the purer the atmosphere, and the higher the situation of the place, provided there was no dampness, the speedier was his acquisition of strength. The instances of this were innumerable, as were likewise those from a contrary treatment. The 45th regiment afforded one of the most remarkable of the former. The sick soldiers, as soon as they were able to bear any degree of motion, were sent to Hospital-hill, where they were kept till they acquired their usual health; which happened in a surprisingly short time. The distance from Fort George, where the regiment was sta-

convalescere incipiens, si ante quadragesimum gravem aliquem in diæta errorem fecerit, novo erumpente bubone moritur." Treatise on the Plague, p. 165. Was not the breathing of infected air as pernicious as irregularity of diet? And this, from another observation of Dr. Russel, p. 193, seems to have been actually the case at Aleppo. And here I may further remark, that this did not so much occasion relapse as a prolongation of the state of debility, by affecting the stomach in such a manner as to destroy, or very much injure its capacity of action; and, indeed, what Dr. Russel adds on the subject, p. 194, seems rather to confirm the opinion.

tioned,

tioned, to the barracks on Hospital-hill, is fully a mile ; and the ascent, for the most part, is very considerable. Although the sick, at the time they began their walk or ride, from the fort, were apparently so weak and languid, as to be scarce able to bear exercise, before they reached their barracks, instead of being overcome with fatigue, they were sensibly better and stronger. The change to a purer air, a high rocky situation, abundance of good water, and the distance from infection, produced an alteration in a few days : and this was rendered still more remarkable, by their accommodation being cold and exposed to the weather, for the barracks on Hospital-hill, at that time, in which they were lodged, were so much decayed as to admit the rain and wind almost every where.

Under circumstances which did not admit of changes of this nature, much benefit to the patient accrued from moving him from the infected chamber to one adjoining. In the hospitals this was frequently done, and always with the best consequences. I have even extended this removal to that state of the disease which immediately succeeds the inflammatory, and frequently with evident advantage : nor is this to be wondered at, since it is easy to conceive that the violence of a contagious disease will increase

in proportion to the accumulation of infection in the atmosphere immediately surrounding the person afflicted with it. Something of this kind was done on ship board, where the accommodation was in general wretchedly bad and confined. In a few of the ships the Captains had the humanity to give up their cabins altogether to the sick ; and in these, the sick enjoying sufficient room, good air, and better ventilation than between decks, the mortality was infinitely less. The bias which the mind of Dr. Smith, of New York, acquired, from a habit of assigning all fevers to a local origin, led him to attribute this happy consequence of a change of air, or the removal of the sick from the infected chambers, to the prolongation of distance from marsh miasmata. But in his eagerness to establish the opinion of his party, he totally lost sight, in the present instance, of circumstances of no small importance. The sailors who, from their situation, according to the Doctor's statement, could alone be exposed to the influence of marshy vapours, had such existed, were not moved, except in a very few instances, from the ships in which they were seized with the disease : the soldiers of the 45th regiment were totally unexposed to such influence, the situation of the barracks behind Fort George, being such as precluded the supposed exposition:

exposition: and the inhabitants, except the free people of colour, and the lower classes of whites, residing in lower Montserrat, who were not, by any means, generally afflicted with the malignant pestilential fever, enjoyed the same exemption from marshy effluvia. The sophistry of this disingenuous Remarker is in scarce any instance more conspicuous than the one before us. Near the foot of Hospital-hill, on the west side, and between it and Morne d'Elloi, where the river St. Jean disembogues itself into the sea, is an extensive and pernicious marsh, the emanations from which render the station in general extremely unhealthy. Why were not the convalescents of the 45th regiment retarded in their recovery by this cause, if such had originally produced the fever they had laboured under?*

As I considered cleanliness and free ventilation as two principal agents in destroying contagion, I always enjoined particular attention to them; and where these were more immediately in my power, nothing was left undone to effect them. In the royal artillery hospital, when the disease was at its utmost height of violence, I had all the wards successively white-washed; in doing which, I effected another object, the removal of the sick

* Med. Rep. vol. i. p. 486 to 489. .

from infected wards, to others that were not so. After each ward was white-washed, I had several port-fires burnt in it, and the smoke confined for several hours, and afterwards well washed with hot vinegar. Twice or thrice in the week, moistened gun-powder was burnt in each ward; and thrice in the day, the floor and bedsteads of the sick were sprinkled with vinegar. But in order to destroy the seeds of infection as completely as possible, all the blankets, shirts, flannel jackets, and waistcoats of those who died, were burnt immediately after their death; and the bodies carried to a dead-house, some yards distant from the hospital. Sheets, shirts, and other wearing apparel of those who recovered, were first well fumigated with gun-powder, and afterwards washed, before the patient was discharged. The captains of some of the London merchantmen, had the hold and lower decks daily well fumigated with moistened gun-powder, during which the hatches were kept close shut. All the under decks were also frequently washed with hot vinegar, and fires were occasionally lighted below. The beneficial consequences of this attention were remarkably conspicuous; their men recovered their strength surprisingly fast, and suffered no relapse; and new
men

men who were taken on board to replace those who fell victims to the disease, continued well and untainted. It was otherwise with ships on board which these precautions were not observed; relapses or rather a suspension of the disease, were not uncommon, and new men became immediately infected. On the 19th of May, a letter of marque, belonging to Liverpool, brought into the Port of St. George the crew, thirty in number, of a French vessel she had captured on her passage from England. These, on account of the scarcity of seamen, were distributed among the merchantmen most in want. Many of these people were immediately infected and died; and it is remarkable that the lot of these unfortunate men was to be put on board the least cleanly, and of course the most infected ships.

Since these observations on the efficacy of change of air and situation were published, innumerable instances have occurred which confirm the propriety of them. One general remark appears to be the fair result, that a change of situation to one unfavourably circumstanced with respect to marshes, does not prevent the re-establishment of the health of the sick, in the malignant pestilential fever, unless the residence is lengthened so as to give time to a new cause to excite a new morbid

morbid action in the system; but that a similar change will inevitably and instantly renew the morbid action of marsh effluvia in convalescents from the yellow remittent fever.

SECTION II.

Diet.

SUITABLE diet was the next means of restoring tone and energy to the system. During the existence of the disease, it was of little importance whether the patient took nourishment or not; and indeed, from the circumstances under which the sick generally laboured, it is evident that nothing material in this way could be administered. It was otherwise, however, the moment signs of recovery took place. The great object was to select such articles of food as were most palatable, most simple, most nourishing, and of smallest bulk; for nausea was readily excited, the general debility was very great, and the digestive powers were very imperfect. Most liquid aliment, especially soups, were very disagreeable, and readily excited nausea; meats were sometimes acceptable, but very few were admissible. Sago, panada, and the preparations of the Indian arrow root (*maranta galanga*), with a large proportion of Madeira wine, well spiced, were by far

far the most agreeable, the lightest, and the most nourishing. To these, therefore, with the occasional addition of a soft fresh egg, I confined my convalescents : and I regulated the manner and frequency of giving them, by the rule laid down by Celsus : “ *Cibus non multis quidem, sed sæpe tamen nocte ac die dandus est ; ut nutreat neque oncret.*”* It is remarkable, and totally contrary to what happens during convalescence from other fevers, that wine in general was extremely disagreeable to the patients ; and it was with much persuasion and difficulty they could be prevailed on to use it. Madeira, and the richer sweet wines, were the most unpalatable ; Hock and Rhenish wine were often taken with pleasure ; but Port wine was the least unpleasant of any. All convalescents were uncommonly fond of porter and small beer ; and when permitted, greedily indulged in them. As they always agreed well with the stomach, and as it was of the utmost consequence to please where it could be done without injury, I generally allowed the liberal use of these liquors. Riding, and moderate exercise of any kind, contributed very much to the restoration of health.

In some whose viscera became permanently

* Lib. iii. c. 19.

diseased from improper treatment or imprudence, hectic heats, and colliquative sweats, and diarrhœas took place. Several of those who could change the climate, fell victims to the sequelæ of the malignant pestilential fever. Milk diet, country air, and chearful society, had some effect in relieving those patients; but a northern climate was always the last resource, where it could be obtained.

CHAPTER IV.

*On the Use of Mercury in the Malignant Pestilential,
and Yellow Remittent Fevers.*

UNHAPPILY for their patients, as well as for the nation in general, physicians have been much divided with respect to the efficacy of mercury in the fevers of warm climates in general; but this has been more especially the case in the malignant pestilential, and yellow remittent fevers; in which an opinion has obtained, that the character of the morbid action distinguishing them is putrid, and requires a counteraction excited by stimulants and tonics. This theoretical notion has been the bane of thousands; but the blood of tens of thousands cannot efface the fatal impression which theory, and deep-rooted prejudice, have made: and consequently, we still hear, after the destruction of two West India armies, and of a host of individuals in private life, of putrefaction being the alarming circumstance to be attended to in the treatment of these fevers. It must be confessed that this theory, and the received idea of the mode

mode in which mercury acts in the system, are so opposite to each other, that we cannot be surprised to find inexperienced men inveighing against the administration of mercury in fevers supposed to depend on a putrefactive process. But should they not at least pause before they give so decided a negative, when they are informed that the result of multiplied experience is highly in favour of mercury. Let the merits of the tonic practice, such, at least, as appear to be the fair product of impartial observation, and those of the mercurial treatment, be duly considered and compared, and let the result be candidly stated. If after this there should still remain a bias in favour of the former, then I shall only have to say

“ *Pro deum atque hominum fidem ! quod hoc genus est ? quæ hæc conjuratio !*
In eodem omnes mihi, videntur ludo doctæ ad malitiam.

The question respecting the efficacy and inutility or deleterious effects of the mercurial practice in malignant pestilential fevers, and the higher grades of the remittent fevers of hot climates, has been much agitated ; but it is to be presumed that those who maintain the opinion which militates against its utility and safety, are badly qualified to discuss the point. The principal arguments proposed against the practice, are drawn either from imperfect experience, or from those

sources which false theory made an imaginary discovery of; or from an indolent reliance on received opinions, promulgated by high medical authority, which time and imbecility have matured into what Dr. Beddoes has well named “supine scepticism.”

The most deserving notice of the various propositions tending to alienate the inexperienced practitioner from the resources which mercury holds out in dangerous cases of fever, are those founded on the novelty of the practice; on its militating against the received theory of the nature of malignant pestilential, and the yellow remittent fevers of hot climates; and on the very limited duration of diseases of this description, which it is said, does not admit the administration of a quantity sufficient to excite salivation, whereby, even admitting its utility, time enough is not given mercury to act. To those who have permitted themselves to be convinced by facts, these objections will appear futile and unfounded: but to those, who necessarily draw their information from the report of others; and form their opinion by the degree of credibility they attach to them, it may be necessary to offer the observations which the consideration of these arguments, compared with the result of experience, has suggested.

SECTION I.

How far are we to consider the Practice as New, in the West Indies?

ON the supposition of the exhibition of mercury in fevers of hot climates, being new, it surely does not follow, that the mere novelty of the practice, constitutes a sufficient objection to it. On this principle, we should reject remedies of wonderful efficacy in skilful hands, because they are also found to be the most active poisons. Arsenic, the most baneful substance to the vital principle we are acquainted with, has, in situations where the Peruvian bark displayed no more agency than the most inert powder, arrested the progress of the most obstinate intermittents, and destroyed the morbid habit they produced in the system, by the exhibition of only a few drops of its solution in an alkaline menstruum. Had the novelty of this prescription been alone considered, the healing art would have been deprived of one of its most powerful agents.

But, in truth, the mercurial practice was not altogether new in the year 1793. Referring the reader to what Dr. Lind tells us of a practice which had obtained on the Mosquittoe shore, of administering calomel under certain

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circumstances

circumstances of the fever endemic on that coast, without stating his authority : referring him also to the curious strictures of Dr. Warren, on the “ very odd and unwarrantable practice for many years among several of the plantation practitioners, in Barbadoes, of giving calomel in inflammatory fevers ;” and generally stating to him, that Dr. Wright assures us, the use of calomel, in the cure of acute diseases, in Jamaica, was practised by a Dr. Smith, of Savannah le Mar, a considerable time before he himself began to administer it in 1764 ;* I shall request his attention to

* Lind’s Essays, edit. 1774, p. 267. Warren’s Treatise concerning the Malignant Fever in Barbadoes, 1721 to 1733, p. 33. Dr. Wright’s practical Observations on the Treatment of acute Diseases of the West Indies. Med. Facts and Obs. vol. vii. Dr. Holyoke, of Salem, State of Massachusetts, says, “ a physician from Scotland, who was a disciple of the celebrated Pitcairn, about 60 or 70 years ago (about 1727), was much in the habit of administering mercurials, and much promoted their use, if he did not originate it, at Salem.” But what principally contributed to give the faculty a high idea of this medicine, and to bring us acquainted with its virtues and uses, was the happy effect it was found to have, in checking the progress of a most formidable disease, which broke out in this part of America about the year 1734 or 1735, and made cruel havock, sweeping off multitudes of children, wherever its baleful influence extended: I mean the disease at that time called *the throat disemper* ; which I suppose to have been of the same genus with Dr. Huxham’s malignant ulcerous sore throat.” No remedies availed, till recourse was had to Turpeth mineral, and calomel. This authority is more worthy our attention, as the inflammatory

to a fact which occurred at Grenada, in the year 1788, by which it will appear, that calomel was found the only efficacious remedy in a most destructive yellow remittent fever, which prevailed among the soldiers of the 45th regiment, and originated in the shameful and most criminal neglect of their commanding officer at that time. Dr. Lindsay, assistant inspector of hospitals, was then surgeon to that regiment; and, together with the late Mr. Denholme, the garrison surgeon, drew up a report of the disease, and its treatment, for the information of the Medical Society of Grenada. These gentlemen observed, that, “after finding general evacuations, &c. had no effect in retarding the progress of the disease, calomel, combined with camphor, Dover’s powder, &c. was thrown in, latterly, in very large and repeated doses; which, in eight out of ten cases, with the worst symptoms, seemed evidently, by its action, in keeping open the biliary ducts, and procuring a vast number of stools highly bilious, to have arrested the progress of the disease, as the suffusion on the skin, and every other bad symptom in the above eight cases very soon went off.” The impression which this made on my mind,

matory diathesis prevailing during the presence of the malignant ulcerous sore throat, is precisely such as characterises the malignant pestilential fever. *Med. Repository*, vol. i. p. 500.

together with what I experienced in a fever of a similar nature, about three years after, in the corps of artillery; and the recollection of the happy event which resulted from treating with calomel, an anomalous hepatic fever in 1786;* influenced me in adopting the mercurial treatment in the malignant pestilential fever; and affording an ample testimony of what it is possible to do in dangerous fevers with that invaluable medicine, should have had a due weight on those medical gentleman of the island who sceptically opposed the practice.

SECTION II.

The curative Action of Mercury.

WITHOUT entering into any discussion of the principles on which the curative action of mercury, in the system, is founded, I shall only, in general, observe, that whether this is owing to a new action introduced, and which, being pre-eminently powerful, restrains the progress of that of the morbid poison, constituting the essence of the disease, and at length destroys it;—or, whether this proceeds from the extrication of vital air from the mercurial oxyd, which has a tendency

* Med. Commentaries of Edinburgh, decade i. vol. i. and viii.

to destroy the morbid combination, denominated the gaseous oxyd of azote, or the little less pernicious basis of marshy effluvia;—or whether it arises from a salutary stimulus the system receives from it, which excites a disposition to absorb a larger portion than usual of oxygen from the atmospheric air; that, whichever of these is the principle on which the curative action of mercury, in the system, in the malignant pestilential, and yellow remittent fevers, depends, it certainly cannot be accounted for by the received theory of these diseases, or that of mercurial action. Indeed, the more we inquire into the nature of the diseases, in which this medicine has been successfully administered, the more we shall be convinced of the truth of this position. If mercury dissolves the humours, how can it cure fevers supposed to be essentially putrid? If it strongly stimulates, how can it have a curative operation in diseases of an inflammatory diathesis?

In our present ignorance of the constituent principles of mercury; and our very imperfect knowledge of the chemical properties of the blood, and of the laws of the absorbent system, to both which we suppose its action is confined; it is impossible to institute what may, in every respect, be considered a rational theory of its curative action in the system. In fact, our progress
beyond

beyond the limits of conjecture, in the investigation, even with all the assistance of pneumatic chemistry, must be very circumscribed, and must be conducted with much caution. There are, however, some general principles, the consideration of which may, perhaps, lead us to a clearer view of the subject, than has hitherto been presented to us. Such as have been demonstrated by a great many facts, or appear divested of fallacy, I shall here lay down, without presuming to draw any determinate conclusion from them.

1. It is evident, that mercury in any state, or in any quantity hitherto ventured on, has no tendency to excite the putrefactive process in the system.

2. It is equally evident, that no dangerous inflammatory diathesis is raised by it.

3. Blood drawn during the presence of the malignant pestilential and yellow remittent fevers, before the administration of mercurial oxyds, is of a dark brown or chocolate colour, and never exhibits a due separation of its parts, on cooling. The same appearance is exhibited in hepatic and pulmonary inflammation, with this difference only, that the coagulable lymph is separated in greater quantity, and is more coriaceous in its texture. The serum is extremely deficient in both.

4. Mercurial oxyds introduced into the system, in these states, soon produce a change in the appearance and texture of the blood. No coagulable lymph separates, the crassamentum becomes florid, and the serum is very considerably augmented.

5. Is not the oxygenation of the blood, in the process of respiration, during health, attended with similar phænomena?

6. Morbid depositions of coagulable lymph, such as these denominated polypi* in the heart, under certain peculiar circumstances, are obviated by the administration of mercurial oxyds.

7. Congestions in the brain, in the lungs, in the liver, and in the glandular system in general, are removed by them.

8. Does not the inhalation of oxygenous gas, sufficiently persevered in, produce similar (7) effects?

9. Oxygenous gas, obtained from the mercurial oxyds, almost always holds a small quantity of mercury in solution: and Chaptal assures us,

* This assertion may, probably, appear extraordinary, but nevertheless the fact has been fully ascertained. A very singular disease which occurred to me at Grenada some years ago, and which, from the peculiar circumstances attending it, I named an endemic polypus, for want of one more expressive, so very much illustrates this fact, that I have been induced to present a short history of it to the reader in the Appendix.

he has witnessed its having produced a speedy salivation in two persons who had used it for disorders of the lungs.

10. Oxygenous gas, disengaged from the oxygenated muriate of potash, the citric acid, and the solution of nitre in vinegar, does not excite salivation.

11. Oxygenous gas, disengaged from the nitrous acid (supposed to have a metallic impregnation) uniformly, in hot climates, excites salivation, unattended with fætor.

12. Certain mercurial oxyds contain more oxygen than others. Corrosive muriate of mercury seems to be the highest degree of mercurial oxygenation; and to be to the mild muriate of mercury, in that respect, as 1 is to 6 (Fourcroy).

13. The ptyalitic action of the corrosive muriate will therefore be excited by a comparatively smaller quantity of that oxyd, because, cæteris paribus, an agent whose power is equal to 6, will produce an effect in that proportion greater than an agent whose power is only as 1.

14. Trituration of mercury without heat, but in contact with air, and with many other substances, reduces it to an oxyd: hence, in the form of an unguent with fatty substances, or in that of pills, with honey, mucilage, crumb of bread; still retaining its oxyd state, it operates

an effect when introduced into the system, similar to that excited by other known mercurial oxyds. It is true, chemists are not agreed in this opinion; some assuring us, that trituration of mercury, with fatty substances, &c. is partly nothing but an extreme division; or, at least, only a part of the mercury is dissolved by the sebatic acid, &c. (Fourcroy). But others seem to hold a different opinion (Chaptal, &c.). Does calomel, and other oxyds of mercury, applied in the form of an unguent; or to the gums and fauces, with saliva; or to ulcerated surfaces in powder, combined with calamine; effect a ptyalitic action merely by their metallic principles; although acknowledged oxyds? If not—trituration mercury, applied in unguent, or received into the stomach in pill form, must also be an oxyd, since it produces an effect in every respect the same.

15. It has been incontrovertibly proved, that, in the tropical climate, at least, there are habits, under the influence of disease, which resist the action of mercury, even after the exhibition of upwards of 2000 grains: and that there are others so susceptible as to have salivation excited on the exhibition of ten grains and less. It is to be presumed, that this difference of result, proceeds from a diversity of susceptibility of stimulus; for,
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it is known, there are habits, in other respects, healthy, acted on by stimuli applied in the mildest form, and others which require the action of the most powerful. Hence, it may not be irrational to conclude, that the susceptibility of, or resistance to, the action of mercury in habits in which the morbid action of the cause of the malignant pestilential, and yellow remittent fevers has already taken place, are in the direct ratio of their excitability.

16. Are there adventitious causes of this excessive or deficient excitability?

17. There are, certainly, certain conditions to be attended to in the morbid states of the body in which mercury has been successfully administered; and these are the reduction of plethora at the commencement, and the augmentation of the *vis vitæ* in the advance.

18. The inhalation of oxygenous gas quickens the pulse from 64 to 120 pulsations; and the abstraction of it lessens the rapidity of the circulation in the same proportion. Hence it has been said, that the pneumato-chemical physician has a power over the heart and arteries, similar to that which a watch-maker has over the movements of a watch by means of the regulator. (Med. Extr.)

19. From some cases of the sequelæ of the malignant

malignant pestilential fever (called yellow fever), treated by the inhalation of oxygenous gas, it appears that pure oxygenous gas is too inactive to produce much beneficial change, till the quantity inhaled by becoming itself, perhaps, a stimulus, gives energy to that received. From two to six quarts, diluted in atmospheric air, per day, for 95 days. (*Considerations on Factitious Airs*, p. 4.)

20. Oxygenous gas, disengaged from oxygenated muriate of potash, does not produce any salutary effects in the higher grade of the remittent fever of hot climates; but, combined with mercury in a highly oxydated state; or followed up by a milder mercurial oxyd, it effects a cure. (*Chapter on Oxygenated Medicines, &c.*)

21. Do these principles admit of the following inference? viz. that mercurial oxyds perform a double office in the system: 1. They decomposed the poison (supposed to be a chemical combination) constituting the basis of the remote cause of fevers, and other diseases in which they are successfully administered, by the oxygene they impart, whose energy is greatly heightened and established by the impregnation of the metallic principles of the mercury; and, 2. They stimulate the absorbents to take up the azote thus disengaged, and to throw it out of the system by the salivary excretories.

These

These observations are to be considered merely as hints to be rejected, if found inapplicable; or improved on, in abler hands, if found capable of elucidating the hitherto elusive investigation of the curative action of mercury. The reader may, perhaps, be assisted by them, in accounting for the large quantities of calomel which have been given in the malignant pestilential, and yellow remitting fevers without effect:* he may also, from the consideration of them, perceive why mercury, so excellent and powerful a medicine itself, has most unjustly, by many, been held as inefficacious or injurious: he may, further, see the cause of a ptyalism being excited, and a cure consequently effected, by the introduction of calomel into the system in the form of clyster, without having recourse to the medium of the

* A very instructive case of this kind is inserted in the first volume of the *Annals of Medicine*, p. 334. Dr. Todd merits much praise for his ingenuous confession of an error which brought about the fatal termination of the disease: he also merits commendation for exhibiting a proof of the dreadful consequences of the division of opinion respecting the use of mercury in the disease before us. "The error committed in this case was delaying the exhibition of the calomel until the stomach had lost the power of being influenced by its action: this arose from the reluctance of the family to the use of this medicine in the prevailing epidemic." In this case, (a young lady of Jamaica, only eighteen years of age), 500 grains of calomel, and eight ounces of the strong mercurial ointment, by friction, were used.

stomach,

stomach, which, by the action of the morbid cause, is often rendered incapable of conveying it into the intestinal canal. Finally, they may furnish him with satisfactory reasons for the inefficacy of mercurial friction alone, in such cases of gastric irritability; but, for the advantages attending it, when employed in aid of other modes of application.

This idea (21) of the manner in which mercury produces the benign effects which are daily seen to proceed from the early and judicious administration of it, is further illustrated, by what has constantly and uniformly happened to those who have been cured of hepatic inflammation by salivation, their strength having been comparatively increased after the mercury had ceased to act. And the state of those patients, who have owed their recovery from the malignant pestilential fever, to this medicine, presents us with a striking proof, that the cause of the disease, or the morbid poison acting on the system, previous to the exhibition of mercury, has been suddenly destroyed by it; as, on the other hand, the state of those whose cure has been attempted by bark, and other tonics, offers a no less satisfactory illustration of these remedies being possessed of no counteracting, or, if I may thus apply the expression, of no antidotal power. In these latter cases,

nature, unassisted by art, would, probably, have restrained the violence of the morbid agent; and at length relieved herself entirely from it. This, at least, is certain, that the number of fatal terminations of the malignant pestilential fever, and yellow remittent, which is daily seen, when the tonic treatment has been pursued, gives little encouragement to the adoption of it, and divests it, in a great degree, of its attributed powers.

But what solidity do the arguments against the mercurial treatment possess, which are founded on the supposed putrid nature of the malignant pestilential, and yellow remittent fevers? What proofs can be brought forward of the actual existence of a putrefactive process in an animal body during life? Is not the very principle of putrefaction inconsistent with the presence of the vital powers, however imperfect they may be rendered by the morbid action of the remote cause of these fevers? The utmost, therefore, I believe, that can be conceded to these theorists, is, that a *tendency* to putrefaction takes place in human bodies labouring under these fevers; that this tendency does not commence till the inflammatory state, constituted by a contest between nature* and the morbid

*“ Ego enim, quotes, naturam nomino, toties causarum naturalium complexum quemdam significari volo; quæ quidem causæ brutæ licet,

morbid poison, has ceased, when the power of the latter predominates, and when, often, a consequent gangrene partially takes place. Having this view of the disease before us, we shall be able to account for the general inefficacy of every possible remedy, when nature has been, in a great measure, deprived of all power of seconding art.

A very slight perusal of the writers on this subject will satisfy us, that they have laboured under great uncertainty with respect to the true nature of malignant and pestilential fevers; that they have bewildered themselves in inconsistencies, and absurd doctrines, founded on principles which have no real existence; and that their curative indications, and the remedies employed to fulfil them, have been equally unappropriate, and unsuccessful. It will also appear, that as the stages of malignant fever have been clearly defined, and a suitable treatment judiciously adopted, the success of the physician has been proportionally great. The few instances of this medical sagacity we are acquainted with, only display the extent of this melancholy truth. To follow such examples, therefore, and to be guided by such

licet, atque omni consilio destitutæ, non tamen sine summo consilio regnuntur, dum suas quoque operationes edunt, suosque effectus exsequuntur." Sydenham. See Waller's excellent Commentary on this passage, vol. i. p. 147, &c.

precepts, when we are aware of their destructive tendency, is to act the part of the assassin: of one “ qui, peior an ignavior sit, deliberari non potest.” The business of the physician, in the treatment of malignant pestilential fevers, is, in itself, a very simple one; and nothing but an absurd reliance on false theories and authorities; or a want of perseverance and steadiness of mind; have rendered it complicated and difficult.

Several phenomena of the malignant pestilential fever, when duly considered, become arguments of considerable weight in favour of the mercurial treatment; and forcibly shew how unavailing, any but a *qualified antiphlogistic practice* must be in the cure of them. Among these I may observe the remarkable peculiarity which appeared during the inflammatory stage; in the inflammation seizing particular organs; in its often affecting them without any external signs of such affection; in its extraordinary tendency to gangrene; in its aptitude to run into the low comatous state, when much debility was induced; in its exciting an increased afflux of blood to the brain, whereby an uncommon exhalation of ferrous fluid from the extremities of the arteries of that organ taking place, compression ensued, of which the dilatation of the pupils of the eyes was an incontestible proof.

SECTION III.

Analogical Proofs of the Efficacy of the Mercurial Treatment in the Malignant Pestilential Fever.

IT is astonishing that physicians should have hitherto proceeded on a blind routine of inept practice in the treatment of malignant fevers, when the utility of a contrary method is rendered evident by many examples of the efficacy of mercury in disorders of a nature almost precisely similar. At Grenada I was induced to rely on the mercurial treatment, not only by what I have already stated, but also by proofs of its efficacy drawn from analogy. I thus reasoned—that as the case was now, it could only be from what has been found useful in disorders of a nature nearly similar, we could make our selection of the means of cure—that the consideration of certain states of inflammation of the liver, during which symptoms arise indicating a febrile diathesis in the system of a character nearly conformable to that of malignant fevers; of the confluent small-pox, wherein a virulent poison gives birth to a train of phænomena nearly similar; and of hydrocephalus internus, in which compression of the sensorium takes place from a

similar cause of congestion ; led us to give a preference to mercury—that the manner which nature sometimes is seen to adopt to relieve herself from the effects of morbid action, however induced, pointed out the means of producing the same end by art—that the dread of generating a worse evil than the present, in a case so desperate, betrayed a weakness unworthy of an enlightened mind, and meriting the most marked reprehension—that the excellent medical maxim, “ de quo dubitare in ejusmodi re non oportet ; satius est enim anceps auxilium experiri, quam nullum,”* should always regulate our practice in such dangerous and dubious cases—that respectable authorities stamped the present practice with the seal of at least analogical propriety, and justified its adoption in the malignant pestilential fever—and that, besides the encouragement held out by Huxham,† Mead,‡ Tifot,§ Cullen,|| in their observations on salivation in confluent small-pox ; and by many facts re-

* Celsi Medicina, l. 2. c. 10.

† Huxham on the Small-Pox. He thinks it a most judicious practice to promote some other evacuation, when salivation ceases prematurely.

‡ “ In the confluent and malignant small-pox, if salivation does not arise, and even continue to the end of the disease, it is a very bad sign.” Discourse on the Small-Pox and Measles, ch. iv.

§ Avis au Peuple, tom. i. p. 215.

|| First Lines, vol. ii. p. 136.

corded in periodical publications, which establish the efficacy of salivation in hydrocephalus internus;* there are opinions still more pertinent to our present purpose. Thus Hoffman, on malignant fevers, informs us, that “such medicines as by keeping up the strength, attenuate the saliva, and promote expectoration, are likewise of much advantage; for scarce any one who spits freely has been observed to die of these diseases.†” Thus also Huxham assures us that “there is no evacuation of a more favourable portent, than a pretty free salivation, without apthæ; where this happens, with a kindly moisture of the skin, I never despair of my patient, however weak and stupid he may seem.”‡ And thus, too, Dr. Gilchrist, many years ago, entertained the most decided opinion of the antiphlogistic virtues of this medicine. His words are remarkable. “Nothing embarrasses more than *inflammation in a low state*; but *quicksilver is a powerful antiphlogistic, and removes inflammation without accelerating the motion of the fluids, which it rather diminishes, by subduing their inflammatory disposi-*

* Med. Obs. and Inq. v. vi. p. 52 and 67. Med. Comment. vol. v. p. 174; viii. 325; ix. 240; x. 356, &c.

† Lewis's Translation of Hoffman's System of the Practice of Medicine, v. i. p. 171.

‡ Essay on Fevers, 6th edit. p. 83.

*tion. When there is little or no fever, it as powerfully resolves obstruction, without diminishing the impetus of the blood; on a proper degree of which resolution depends."** In several instances of the malignant pestilential fever I have observed a fact which is certainly curious, and strongly illustrative of Dr. Gilchrist's opinion: in the low comatous state, when the mercury already exhibited failed of producing salivation, and, consequently, of effecting the change in the disease which is attended with signs of recovery; and when the stomach was sufficiently retentive, such stimulus, or such tone has been given by the bark, as enabled the former to act. The moment this was effected, signs of recovery appeared. In very acute inflammations of the liver, I have a thousand times seen, on the contrary, that the operation of the mercury is forwarded by diminishing the tone of the system, by means of very liberal bleedings. An effect similar to the former is also produced in ill-conditioned venereal ulcers, attended with hectic symptoms; the use of the bark gives much efficacy to mercury; and indeed the latter, in these cases, is seldom useful without the former.

To multiply further arguments and proofs drawn from analogy, does not seem necessary;

* *Essays and Obs. Physical and Literary*, v. iii. p. 498.

those already offered are surely sufficient to justify even the *empirical* administration of mercury in the malignant pestilential fever, wherein the danger is so imminent when recourse is not had to bold practice. They justify also the application of the same practice to the yellow remittent fever, in which it proves superior to every mode hitherto imagined or adopted.

SECTION IV.

Is it possible to throw into the System a Quantity of Mercury sufficient to arrest the Progress of the Malignant Pestilential, and Yellow Remittent Fevers?

THE objections founded on the rapid progress of these diseases, and on the supposed slow operation of mercury, or the difficulty of introducing a sufficient quantity to effect a salutary change of action, are more formidable in idea than reality. The administration of small doses of this medicine certainly could not produce a salutary effect; and as the general imbecility or timidity of practitioners restrained them from a bold exhibition of it, no wonder they should find the remedy, in their hands, unsuccessful. But
they

they have gone further ; and because a few grains of mercury, timidly administered, failed to cure, they have branded the medicine as “ insufficient in doses not immediately endangering life ;” or as a certain poison if extended beyond the imaginary limits of safety. The uniform experience of judicious practitioners displays the preposterous conduct of these gentlemen in its true light. A steady perseverance in the exhibition of mercury, and augmenting the dose, and varying the mode of administering it as the danger increased, and as circumstances required, have, in many cases, which would be considered by the timid and unexperienced as in the last degree desperate, proved successful by at length exciting salivation. It is true great and skilful attention is required ; and it is equally true that stated visits, and leaving the administration of the medicine to persons not interested in the event, or whose stupidity incapacitates them from comprehending the necessary directions, give the medicine but a small chance of succeeding. This, however, being a prevalent practice, we are less astonished to hear how ineffectual mercury has been—for that constitutes an excellent cloak to conceal the injustice done it.

SECTION V.

Is Salivation a necessary Condition in the Mercurial Treatment of the Malignant Pestilential Fever, and the Yellow Remittent Fever?

THIS important question has been often agitated ; and the source of doubt has probably been what is called the alterative course in the treatment of general venereal affections, in which salivation is considered not only as unnecessary, but as unjustifiably hazarding the constitution of the patient. I shall not take up the time of the reader in an enquiry respecting the principles on which this opinion is founded ; but I may safely lay it down as a maxim resulting from incontrovertible facts, that, in general, no cure has been completely effected in the malignant pestilential fever, in which mercury did not affect the salivary glands. The only exceptions may be those slight cases of the disease which, as I have already remarked, nature unassisted might have cured. Other cases whose symptoms were more violent, and which, although mercury had been exhibited, apparently terminated favourably without salivation, cannot be considered as exceptions, because in them the morbid action was evidently
only

only suspended, not superseded. When the patients in such cases have recovered, it has not been till after the expiration of much time, and the co-operation of a change of situation and air. In such cases, too, the removal of the general disease has sometimes been dearly purchased by the sacrifice of some one important organ, such as the liver or lungs; in which abscesses have taken place, or from whose disordered state cachexical affections of the general system have been superinduced.

That salivation may be considered as a necessary condition in the mercurial treatment of the malignant pestilential fever, seems to derive a considerable share of confirmation from facts which show that morbid action in the system continues undiminished as long as mercury, after being introduced into, remains without discovering any external sign of operative effect on the body. To those already on record I may be permitted to add the following singular instance of the activity of a morbid cause, and the indolence of the counteracting agent, being exactly proportional to each other. I extract the case as it was inserted in my note-book, at the time it occurred in my practice at Grenada in the year 1789.

A negro named Achilles, belonging to the
estate

estate of St. George, of a stout make, and aged about 30, had been for several months without intermission on a course of mercury for a lues venerea, without the symptoms in the smallest degree yielding, and without the mercury acting in any evident manner. The principal symptom was a very large ulcer in the right groin, the consequence of a buboe, which, for nine or ten months, notwithstanding constant mercurial frictions, and large quantities of calomel, had gradually been enlarging, and daily assuming a worse aspect. The want of efficacy in the mercury induced me, after so long a trial of it, to give it up altogether, and to content myself with directing the patient to dress the ulcer with a little common cerate. At the expiration of a year after the mercury was laid aside, I was sent for express to see this negro, who, the manager informed me, was breathing his last. I found him totally insensible, and every five minutes seized with the most violent convulsions I think I ever saw. The manager of the estate informed me, that about half an hour before I saw him, Achilles was suddenly, and without any evident cause, seized with convulsions: and that immediately before he seemed to all about him in his usual health. I made every possible enquiry relative to the cause of so extraordinary a complaint, but

without

without being able to discover any thing that could lead to a knowledge of it. His insensibility was such that very hot smoothing irons applied to the soles of his feet had not the least effect in rousing him. During more than three days I tried every thing I could think of to relieve him, without effect. At length all at once a most copious salivation came on, and at the same instant the convulsions ceased. As the spitting became more abundant, all his disagreeable symptoms proportionally abated. At the end of two days he recovered his sensibility; and in a week he was perfectly well, the spitting only occasioning a painful forencess of his mouth. But the most singular circumstance of this case is, that the ulcer changed its appearance almost instantly; and that in the course of a month after the supervention of the salivation, it became perfectly cured and healed. About a year after, when I next saw him, he was working in the field with the rest of the gang; and had his appearance so changed for the better that I scarce knew him. Dr. Davidson, of Fort Royal, furnished me with a case of the malignant pestilential fever, which occurred to him in 1796, still more in point. “ William Nettleton, of the civil department of the Ordnance, about 21 years of age, and of a florid complexion, was attacked,

on the evening of the 21st of July, with the usual symptoms of the epidemic. I saw him early on the morning of the 22d, and began him with the calomel in doses of ten grains repeated every three hours. I found his mouth considerably affected in the evening, and his febrile complaint entirely gone. The calomel was omitted. The next morning (23d) the affection of his mouth was entirely gone off, and a return of fever, with violent headach, pain in the limbs and calves of the legs, obliged me again to have recourse to the mercury, and that evening, finding his complaints gone, and his mouth much affected by the mercurial action, I again desisted from its use, but I was surprized in the morning of the 24th to find a return of all the former febrile symptoms, whilst those of the mercurial action had entirely ceased. I therefore began the third time with the mercurial course, which I followed up until his mouth became completely affected, which prevented a return of his fever, and he recovered in the course of a few days."

In thus considering salivation as a necessary condition in the mercurial treatment of the fever before us, I am not unsupported. Several proofs shall be hereafter laid before the reader from the communications of very respectable and eminent West India practitioners. Here I am happy to mention

mention the name of Dr. Rush, as a strenuous and very eminent assertor of this truth. "The good effects I had observed from a salivation in the yellow fever of 1793, induced me to excite it as early as possible in all those cases which did not yield immediately to bleeding and purging. I was delighted with its effects in every case in which I used it." "I wish it were possible," he adds, "to render the use of this remedy universal in the treatment of malignant fevers."*

It has been objected to the practice of exciting salivation in the shortest possible time, that we often produce a discharge to which the powers of the patient are unequal, and under which he must necessarily perish. Although I have seen salivation raised to a degree which daily produced a discharge of fully two quarts, and sometimes accompanied with considerable quantities of blood—and although during a considerable part of its duration, the inflammation and ulceration of the throat rendered the swallowing of nourishment of any kind and in any form extremely difficult; yet have I never as yet met with a single case which, after salivation had taken place, proved fatal. In this declaration I am confident I shall be seconded by every experienced and liberal practitioner in the West Indies. I

* Med. Inq. and Obs. v. iv. p. 93.

do not confine this assertion to the malignant pestilential fever; but, with equal confidence and equal conviction, from reiterated experience of its applicability, extend it to the yellow remittent fever, and other diseases of warm climates depending on local derangement, or characterised by a peculiar inflammatory diathesis. I am again happy to acknowledge my obligations to Dr. Rush for his support. "The occasional inconveniences which attend it (salivation) are not to be named with its certain and universal advantages. During the whole of the late season in which the yellow fever prevailed, I saw but two instances in which it probably loosened or destroyed the teeth."*

This objection has been very generally urged by the gentlemen of the medical staff of the West India army, appointed in 1795 and 6; but I am well assured that their knowledge of the effects of mercury in the treatment of the malignant pestilential fever, or the yellow remittent of the country, has been by far too limited to enable them to give a candid opinion. One fact, and a decisive one it certainly is, I have the best authority for. My friend, Dr. Lindsay, who for some time directed the army hospitals of the line; and for a longer period, attended them as

* Med. Inq. and Obs. v. iv. p. 94.

a physician; after the capture of the French islands, assured me, on his return to the West Indies; in 1797, as Assistant Inspector, that the mortality in the army of Sir Charles Grey, was infinitely less than that in the army of Sir Ralph Abercromby: and stated the cause to be, that the mercurial treatment inculcated by himself, and others, wisely, and fortunately then employed, acquainted with the diseases of the climate, and experienced in the superior efficacy of this treatment, was very generally adopted: and being judiciously pursued, was followed by its usual happy consequences, so circumstanced. The information of Dr. Lindsay has been strengthened and confirmed by several medical gentlemen who attended the hospitals at the same time. The circumstances of these armies were very different. The former had the fatigues of a very arduous campaign to undergo, in the capture of three islands, and the defence of one, under circumstances extremely unfavourable: the latter, after the imperfect reduction of St. Lucia, and the light service they performed at Grenada and St. Vincent, went into quarters. Yet the mortality of the latter considerably exceeded the whole strength of the former.* Let

* Several circumstances prevented the accuracy in the statement of mortality in Sir Charles Grey's army, which may be perceived

the reader make his own comments on the statement in the note.

As a further confirmation of the salutary condition that of the army of Sir Ralph Abercromby. The first is, however, as correct as it was possible to obtain it, and the deficiency, if there is really any, amounts only to a very few rank and file. The number of officers is perfectly exact.

1st, State of the Mortality in the Army commanded by Sir Charles Grey, from the 1st of February, to the 1st of September, 1794.

Officers	-	-	-	-	-	214
Non-Commissioned Officers, and Rank and File						5808
Total						6012

It is necessary to remark that a ship or jail fever had broke out in some of the transports in their passage from England to Barbadoes, and that the 56th, and another regiment, were thereby rendered totally unserviceable, from the loss of men, during the whole of the above period, but that their loss is included in the state.

2d, State of the Mortality of the Army arrived with Sir Ralph Abercromby, from the 1st March, 1796, to the 1st of April, 1799.

Brigadier Generals	Lieutenant Colonels	Majors	Captains	Lieutenants	Ensigns	Adjutants	Qu. Masters	Regimental Surgeons	Assistant Surgeons	Rank and File	Total
2	20	12	46	163	58	11	9	14	17	13,437	13,809

Of the general number of deaths in both armies, viz. 19,821, about 2000 may be allowed for death by the sword or in battle, so that 17,821 fell by disease; and as the malignant pestilential fever, and the yellow remittent, were by far the most prevalent, may state the devastation committed by them as fully equal to 15,000. It is to be observed, that after the month of February, 1797, the mortality was partial and trifling, the pestilential infection having ceased spontaneously about that period; consequently no more than one-twentieth of the 13,809 died subsequent to the 1st of April, 1797.

sequences of exciting salivation in the cure of the malignant pestilential fever, I shall present the reader with the following curious facts I have been favoured with from a very ingenious and skilful medical gentleman of the army, Mr. Muttleberry, formerly surgeon to the 59th regiment, at Antigua, where the circumstances were related to me. This gentleman went out to the West Indies, in 1796, as surgeon to a battalion of grenadiers, in the Valentine East Indiaman. Some grenadiers of the 88th regiment brought the infection of the malignant pestilential fever on board ; and the disease spread like wild-fire, taking its course from that part of the ship which the soldiers of the 88th grenadier company occupied, round the ship, in regular succession. A great many died, because, as he ingenuously, and much to his honour, confessed he knew not the disease, nor the proper mode of treating it. At length, an officer on board, put my Essay into Mr. Muttleberry's hands, which he carefully studied. He immediately adopted the treatment recommended, and afterwards scarce any died, salivation always securing a cure. Mr. Muttleberry's success, contrasted with that of the medical gentlemen, under whose charge the sick of the Valentine were placed, on her arrival at Barbadoes, confirmed him in the propriety of the mercurial

mercurial treatment, and in the necessity for exciting salivation.

The success experienced by Dr. Bishop, at Fort Royal, during part of the time he served there as surgeon to the 1st West India regiment, in 1796, exhibits a proof, if possible, still more decisive of the efficacy of mercurial salivation in these fevers. This gentleman out of 45 cases of malignant pestilential fever, lost only two, a proportion unequalled in the West Indies, and perhaps not much inferior to that at Philadelphia. This uncommon success was chiefly owing, however, to the persevering care and attention of Dr. Bishop, who, not only administered the calomel himself, till salivation was excited, but watched the changes of the disease, and prevented any improper interposition of medicine, diet, or advice.

SECTION VI.

What are the best Means of accelerating the Action of Mercury on the salivary Glands?

AS there are strong reasons for believing that salivation is a necessary condition in the mercurial treatment of the malignant pestilential fever, or of any other general febrile affection, in which mercury is found to be the most efficacious remedy; it becomes an object of the greatest importance to

ascertain the means of accelerating the action of that medicine on the salivary glands, when, from a peculiarity of constitution, the debility induced by the disease, or the spasmodic state of the stomach, it remains inactive in the body, or is rejected before the effect expected from it can be produced.

1st, When this proceeds from a constitutional cause, the application of mercury must be varied in every possible manner. It often happens that although a large quantity of calomel is received and retained by the stomach, without any visible effect, a smaller quantity of mercury introduced by means of friction, has excited a salivation. When, therefore, from the information of the patient himself, or from the inefficacy of the first day's exhibition of the calomel, there is an early apprehension entertained of an unsuccessful issue of this mode, frictions to every part of the body where there is a change of absorption, should be recurred to; and from thence much advantage may be obtained, if assiduously and carefully employed.

In such circumstances it has been recommended to rub the gums and the inside of the cheeks with calomel moistened with saliva: but I can safely aver, that I never experienced the smallest advantage from the practice; on the contrary, troublesome

troublesome ulcerations have been produced without any increase of salivary secretion.

When this unaptness of the constitution to be affected by calomel is accompanied by a costive habit, either consequent upon the disease, or also constitutional, much benefit has been derived from the addition to the calomel of a medicine capable of quickly and strongly stimulating the intestinal canal. Thus jalap has frequently given the calomel a tendency to excite the secretion of saliva: and probably thus, the mercurial purgatives so highly extolled by Dr. Rush, and other American physicians, in the fever of Philadelphia and New York, have acquired an efficacy, which has induced the former to consider them as almost specific. That stimulants possess the power of rousing the constitution from this habitual indolence, in cases where mercurial action is necessary, has been sometimes experienced in other diseases: thus an emetic will bring on a free discharge of saliva, after mercury had been in vain exhibited with that intention for a considerable length of time. A medical gentleman of acute observation, informed me, that when he was assistant surgeon to a regiment at Gibraltar, he once gave a considerable quantity of mercury, in every form, to an officer of the regiment, afflicted with an obstinate venereal complaint,

plaint, without being able to excite salivation. In this state, his patient one day felt so unpleasant a degree of nausea, as determined him to take an emetic of tartarized antimony, which produced violent agitation. Almost immediately after, symptoms of ptyalism suddenly came on, and those of lues as suddenly disappeared. The unexpected application of cold, under similar circumstances, has produced similar effects. A much respected friend of mine, during the late Caribbean war at St. Vincent, in which he took a very active part, laboured, unfortunately, under complaints which obliged him to take large quantities of calomel, whilst the situation of the island required his utmost exertion in the field. His constitution habitually resisted the action of mercury, consequently no visible sign of any operative effect could be perceived till an accidental soaking excited it. He lay with his company under arms a whole night, exposed to an excessive and uninterrupted rain, so near the enemy that no fire could be lit to prevent a consequential chill. An universal tremor, shivering, and coldness, took place in his person, and he had the apprehension of premature death, when a salivation suddenly coming on, relieved him at once from his present adventitious miseries, and from the complaints for which mercury had been exhibited.

2d, When the tardy action of mercury proceeds from debility, induced by the disease, the danger is infinitely augmented, and demands the combination of every means which may communicate tone to the body. For this purpose I have had recourse to a variety of medicines and applications: but the system reduced to this state, is roused with the utmost difficulty; and the most powerful tonics have, in by far the greatest number of cases, proved totally useless. Those I have chiefly depended on in such circumstances, are—injections of a mixture of bark and port wine, with a small portion of a watery solution of opium: the vitriolic æther given in small doses, but unremittingly persevered in: the application of blisters, and of strong mercurial ointment to the blistered surface: the cold bath, made use of every third or fourth hour, with spiced wine after each application of it: the solution of arsenic in water, with prepared kali; so certainly effectual in the most obstinate intermittents: and the decoction of tobacco exhibited by injection.*

During

* Dr. Currie, of Liverpool, in his late valuable work on the effects of water cold and warm, &c. has presented us with three excellent general rules for the application of cold water to the body labouring under fever: and as they are confirmed by experience in the western world, and have a direct tendency to effect much good, and to prevent infinite mischief, I shall here transcribe them. I

During the exhibition of any of these means, the calomel and mercurial frictions are to be persevered in, and their quantity increased, as the danger

shall only first observe, that without having the smallest acquaintance with Dr. Currie, except from report, nor with his sentiments relative to the use of cold bathing in fever, we have adopted pretty nearly the same mode of applying it.

“ The safest and most advantageous time for using the asperision or effusion of cold water, is when the exacerbation is at its height, or immediately after its declination is begun ; and this has led me almost always to direct it to be employed from six to nine o'clock in the evening ; but it may be safely used at any time of the day, *when there is no sense of chilliness present, when the heat of the surface is steadily above what is natural, and when there is no general or profuse perspiration.* These particulars are of the utmost importance.

“ 1st, If the asperision of cold water on the surface of the body be used during the cold stage of the paroxysm of fever, the respiration is nearly suspended ; the pulse becomes fluttering, feeble, and of an incalculable frequency ; the surface and extremities become doubly cold and shrivelled, and the patient seems to struggle with the pangs of instant dissolution. I have no doubt, from what I have observed, that in such circumstances, the repeated affusion of a few buckets of cold water would extinguish life. This remedy should, therefore, never be used when any considerable sense of chilliness is present, even though the thermometer, applied to the trunk of the body, should indicate a degree of heat greater than usual.

“ 2d, Neither ought it to be used, when the heat measured by the thermometer, is less than, or even only equal to the natural heat, though the patient should feel no degree of chilliness. This is sometimes the case towards the last stages of fever, when the powers of life are too weak to sustain so powerful a stimulus.

“ 3d, It is also necessary to abstain from the use of this remedy when the body is under profuse perspiration, and this caution is more important in proportion to the continuance of this perspiration.

danger of the patient becomes more imminent. I may here observe, that if the opinion of those writers is adopted, who advise the discontinuance of

tion. In the commencement of perspiration, especially if it has been brought on by violent exercise, the affusion of cold water on the naked body, or even immersion in the cold bath, may be hazarded with little risk, and sometimes may be resorted to with great benefit. After the perspiration has continued some time and flowed freely, especially if the body has remained at rest, either the affusion or immersion is attended with danger, even though the heat of the body at the moment of using them be greater than natural. Perspiration is always a cooling process in itself, but in bed it is often prolonged by artificial means, and the body is prevented from cooling under it to the natural degree, by the load of heated clothes. When the heat has been thus artificially kept up, a practitioner, judging by the information of his thermometer only, may be led into error. In this situation, however, I have observed that the heat sinks rapidly on the exposure of the surface of the body even to the external air, and that the application of cold water, either by affusion or immersion, is accompanied with a loss of heat, and a deficiency of reaction, which are altogether inconsistent with safety.

“Under these restrictions the cold affusion may be used at any period of fever; but its effects will be more salutary in proportion as it is used more early. When employed in the advanced stages of fever, where the heat is reduced, and the debility great, some cordial should be given after it, and the best is warm wine.” p. 17—20.

With respect to the use of the affusion of cold water, in the advanced stages of fever, the result of my experience will be perceived to differ from that of Dr. Currie (p. 30, 49). But a difference of climate, and circumstances of the fevers in which the remedy has been employed, may reconcile the opinions drawn from different results of the same practice. and the probability of this, seems to be confirmed by a similar contrariety existing at Manchester, as recorded

of mercury “ when actual symptoms of putrefaction have taken place in fevers; such as hæmorrhages, petechiæ, or purple spots; for in such
a state

corded by Dr. Ferrier, in a note on this subject. “ I observe, says he, with great satisfaction, that Dr. Currie’s experience of this remedy, and my own, illustrate each other. He has already established its utility at the first accession of fever; and I have found it invariably safe and salutary in the more advanced state of the disease, when he generally declined employing it. Perhaps from difference in situation and employments, there may be more tendency to partial congestion, in our epidemic (typhus), than in that of Liverpool. *Med. Hist. and Reflections*, vol. iii. p. 87.

The invariable efficacy of the arsenical solution in the cure of intermittents, however obstinate and long continued they may be, displayed in a multitude of cases in the Ordnance Hospital at Fort Royal, first suggested the propriety of administering it in the low state of the yellow remittent fever. It sometimes proved successful, in doses of 20 drops, in a little spirit of lavender and water, repeated every four hours; for by its stimulation, renovating the living principle, it gave activity to the mercury. The solution was thus prepared. Take of finely powdered arsenic, and pure kali, each 64 grains, of water 20 ounces; place them in a Florence flask, in a sand bath, till the quantity of water is reduced to 14 ounces; then filter, and add 2 ounces of spirit of lavender. For the first idea of employing the stimulus of tobacco to the system reduced by morbid action, I am indebted to Dr. Currie, p. 135. Probably the cases I employed it in, soldiers of the foreign artillery, in the last stage of the yellow remittent fever, were beyond the reach of any possible stimulation; yet although it proved unsuccessful, it certainly merits further trial; if, as Dr. Currie has remarked, “ it penetrates the system to its very center.”

A fortunate mistake often leads to the discovery of an important truth. A young gentleman at Fort Royal, labouring under the yellow remittent fever, after evacuation by jalap and calomel, was put

a state of the fluids, say they, mercury must be as hurtful as it has been experienced in the real sea-scurvy ;” little benefit can be expected from the whole tribe of tonics, administered without it : the sick will inevitably perish—and I am therefore concerned when I see a judicious practitioner, in other respects, regulating his practice by the precepts of theory, when experience so unerringly inculcates the necessity for the bold administration of this excellent remedy to the

put on the mercurial treatment, aided by the assiduous employment of cold bathing, which reduced the pulse, every time it was applied, from 120 to 90, and the febrile heat from 103 to 98. His fever gained ground, however ; and, together with petechiæ, excessive irritability of stomach and other bad symptoms ; a soreness of his throat was complained of. Although no morbid appearance could be perceived on examination, it was judged proper to employ the volatile liniment externally to his throat. On the 5th day of the fever the nurse, by mistake, instead of applying the volatile liniment as usual to the throat, had applied more than an ounce of the strong mercurial ointment to a surface which was now in a state of excoriation by the liniment. The consequence was, the mercurial action was almost immediately brought on, and every bad symptom disappeared. From this time he continued to recover rapidly. This case is the more important, because, previous to the accident which induced the favourable termination of the disease, large quantities of calomel had been swallowed, had been rubbed on the gums and inside of the cheeks, and been administered by injection ; and the strong mercurial ointment had been used in friction, and had been applied to several parts previously blistered, without effect.

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laſt. Let it never be forgot, that, at whatever period of the diſeaſe ſalivation is excited, whether the ſuppoſed ſigns of putrefaction have appeared or not, the acceſſion of it is the certain ſignal of returning health. If, therefore, the practitioner has a wiſh to benefit his patient, he will not liſten to an advice ſo ill-founded, and ſo deſtructive in its conſequences.

Dr. Wright, in the MSS. already quoted, ſays, he found the greateſt benefit from the uſe of capſicum in this ſtate of the diſeaſe. “ Where it (calomel) failed, danger was apprehended, yet we did not deſpair. Capſicum or Cayenne pepper pills were given with the moſt marked ſucceſs; and even where the melæna or the black vomit had taken place, capſicum has ſnatched the patient from the moſt imminent danger.” The firſt inſtance of the uſe of this medicine I have met with, was in 1796, at the Naval Hoſpital, at Barbadoes, under the care of an ingenious practitioner, Dr. Robertſon. It was a caſe of ſhip-fever, with great irritability of ſtomach. To obviate this ſymptom, five grains of Cayenne pepper in a thin envelope of opium were given twice or thrice in the day, with the moſt happy ſucceſs. I have had no experience of the Cayenne pepper in the malignant peſtilential fever myſelf; but
from

from the event in a few cases of the yellow remittent fever at Fort Royal, in 1798, I was inclined to think rather unfavourably of it.

3d, When the spasmodic state of the stomach prevents the retention of a sufficient quantity of mercury to saturate the system, means must be employed to render the stomach tranquil, whilst another mode of admission must be adopted, without waiting for the uncertain issue of the most powerful antispasmodics, so called. The fact is, the derangement of the stomach depending on the action of the morbid cause, it will cease only when the latter is counteracted by the appropriate remedy. If, therefore, a method of introducing this in sufficient quantity can be devised, independent upon the absorbents of the skin, which are too often inadequate in their operation; and independent upon the stomach, which in a spasmodic state is incapable of conveying it into the intestinal canal; a cure may be effected, whilst the gastric affection is not exasperated, nor the patient teized by the vomiting constantly excited by the ineffectual swallowing of medicine. That such a method can be devised, I have fully ascertained in cases of the yellow remitting fever in the Ordnance Hospital at Fort Royal. I took the hint from a practice which has been frequently attended with success
in

in certain states of dysentery; clysters of strong mercurial ointment rendered miscible with water by means of mucilage, which in this form never failed to excite salivation; but, no doubt, might have cured without saturation, on the same principle, the production of a new action; as mercurial injections obviate the inflammation of the urethra in gonorrhœa. In a very desperate case of the yellow remittent fever, in the month of June, 1798, an incessant vomiting had rendered a large quantity of calomel thrown into the stomach totally inefficacious, whilst the worst symptoms, black vomit, coldness of the surface with quick pulse, a tendency to coma, &c. threatened a speedy dissolution. In this extremity, I recommended the use of strong mercurial clysters to Dr. Davidson, who assiduously and skilfully discharged the duties of ordnance surgeon. The practice was immediately adopted, and with very great satisfaction indeed, I saw, on the following day, the good effects of it. On the second day after the exhibition of the mercurial clysters was begun, all the bad symptoms disappeared, on a salivation supervening. Having inserted this case in the Appendix, I shall only further add here, that in several other cases similarly circumstanced, the administration of mercurial injections produced the most happy effects. It may not be unnecessary

unnecessary to observe, however, that the patient's strength must not be too far sunk; for, should it, no absorption taking place, the medicine will be necessarily inert. Another caution must be also attended to, to secure the efficacy of the clysters; considerable pressure, with a rolled up towel, against the anus, after the injection of them, must be employed for fully half an hour. With a view to augment tone, I have, since the time mentioned, directed calomel, rubbed up with mucilage or strong arrow-root starch, to be added to the bark injection, with or without port wine; and I think the curative intention has thereby been more completely fulfilled. The clysters, as I have already said, were at first composed of strong mercurial ointment, mixed with a sufficient portion of water by means of mucilage; but as this was found inconvenient, it was changed for a form less tedious in its composition, viz. instead of an ounce and a half of the ointment, from two to four grains of calomel, and a strong solution of sago, or any other mucilaginous aliment, with about two tea-spoonfuls of laudanum, or the watery solution of opium.

If, to remove the irritability of the stomach be the sole object in view, æther, as I have already observed, assiduously persevered in, will often produce that effect; but the most certain me-

thod I know is clysters of a watery solution of asafœtida. These administered three or four times seldom fail; and perhaps the success in the cases I have just mentioned, may, in part, be attributed to two clysters of this medicine. I first made use of asafœtida, with this intention, in the case of Lieutenant Colonel S——h, of the royal artillery, in September, 1796; and he undoubtedly owed his life to it, as it enabled him to use calomel to saturation. An imperfect trial of it was made in 1793, but the smallness of the quantity rendered its success doubtful: each clyster should contain three or four drams of asafœtida. It is not to be imagined however, that this medicine can effect a cure. It is, on the contrary, obvious, that it is directed against a symptom only—with a view to render the admission of mercury more certain; and to suspend the spasm of the intestinal fibres, so that the action of the absorbents may become more perfect. If any further expectation is formed from the exhibition of asafœtida, the practitioner will most assuredly be disappointed: this was unhappily often illustrated in the practice of an army physician, whose opinion elevated asafœtida into a catholicon; and with the substitution of this medicine for hot water, one would imagine he heard a new Sangrado, thus impressing the infallibility of his medical

dical principles. “ Les autres médecins en font confister la connoiffance dans mille fciencces pénibles ; et moi, je prétends t’abrégcr un chemin fi long, et t’épargner la peine d’étudier la physique, la pharmacie, la botanique et l’anatomie, Sache, mon ami, *qu’il ne faut que faigner, et faire avaler et injecter de l’asafetide.*” It is astonishing, that a gentleman scientifically educated, and otherwife poffeffed of professional ability, and pleafing manners, could not be recalled from this abfurdity, nor roused to a fentiment of pity for the unhappy people neceffarily placed under his charge, by the almoft conftant fatal event. Mifchief-working practitioners of this defcription, come under the feventh petition of the litany, and let us therefore devoutly pray, from their uncharitablenefs good Lord deliver us.

SECTION VII.

Is copious alvine Evacuation a neceffary Condition in the mercurial Treatment of the Malignant Pestilential, and Yellow Remittent Fevers.

ANOTHER condition infifted on by fome phyficians, in the mercurial treatment of thefe fevers, is, that a copious alvine evacuation fhould be excited by the calomel. The principal advocate for the depletory practice is Dr. Rush ; and,

from the result, under his management, it appears to be the most successful hitherto adopted. The success, indeed, attending this method recorded by him is so great, as to require no small degree of faith, to give entire credit to it: yet, coming from Dr. Rush, I can harbour no doubt of it. We shall be less astonished, however, when we consider that all the sick who recovered, were seen on the first day. “The remedies which I adopted, says he, and of which I have given a history, cured a greater proportion than 99 out of 100 of all who applied to me on the first day of the disorder, before the 15th day of September.” The Doctor afterwards tells us, that after the 15th of September, his success was much limited, compared with what it had been before that time. But that at no period of the disease did he lose more than 1 in 20 of those whom he saw on the first day, and attended regularly through every stage of the fever; provided they had not been previously worn down by attending the sick.* In a subsequent publication, he again heightens the proportion to 1 in 50. “In Philadelphia and Baltimore, where bleeding, purging, and salivation were used in *due time*, and after the manner that has been de-

* Account of the Bilious Remittent Yellow Fever, p. 308, 315.

scribed, not more than 1 in 50 died of the yellow fever.”* Although my practice was not altogether founded on the principle of depletion, yet had my patients been seen in every instance on the first day of the disease, the success of my mode of treatment, would, I am confident, have been proportionally greater than it was. Under circumstances very unfavourable in respect to the period of the disease at which I saw most of my patients, the proportion of mortality, in my general practice in the pestilential fever of 1793-4, was about 1 in 20. I was early deterred from the depleting practice, to an extent beyond what was necessary to cleanse the first passages, by finding extreme debility uniformly proceeding from it; and I even added opium in many instances to prevent this effect from the calomel, as also to restrain the discharge of that medicine before it had excited salivation, which I soon found to be indispensibly necessary.

Some practitioners in the West Indies I find have adopted the plan of Dr. Rush, but by no means with the wonderful success he has attributed to it. The hospitals have afforded, I fear, but too many proofs of its disastrous consequences in a hot climate. In the year 1796, at Fort

* Med. Inq. and Obs. vol. iv. p. 115.

Royal, where the malignant pestilential fever was epidemic, many of the practitioners gave calomel and jalap, in the manner recommended by Dr. Rush, and consequently excited a most profuse discharge. The event was, however, very different from the statement of Dr. Rush; for the mortality among the inhabitants was very great; some ships were entirely stripped of their crews, and many lost more than one half. I am well assured, that 5 out of 6 perished on this occasion, of the whole seized with this dreadful malady. A hypercatharsis was induced, under which the sick irremediably sunk. Nor does the practice appear to be more successful in the yellow remittent fever: for, in the year 1798, it was employed at Fort Royal, in this disease, but scarcely one recovered. It must not be concealed, however, that as this disease was chiefly confined to the shipping, and some of the lower class of whites inhabiting that part of the town called the Carenage, the practice of which is, in a manner, monopolized by one or two quacks as ignorant as presumptuous, the injudicious exhibition of the medicine might have had no small share in the production of so fatal an event. An ingenious medical friend, from whose report I have taken these latter particulars, added, that one of these atrocious pretenders to medicine, more ignorant

norant than his brethren, but whose shameless and assiduous solicitation on the arrival of strangers, had secured their almost exclusive preference, had the foolish impudence to boast, that while his associates in this murderous craft, lost all, he saved one out of eight. Instances such as this, merit attention on no other account than, that whilst the enormities of these presumptuous men may be displayed in their true colours, the fatal consequences of inordinate evacuation which took place, may illustrate the impropriety of the depletory system in the yellow remittent fever within the tropics.*

Upon

* How much is it to be wished, that the severity of the Gothic laws against quacks and pretenders to the practice of medicine, is not extended to such of the present day, or such as have not been found duly qualified, *by proper judges*, to exercise the healing art. Were such forfeits annexed as the following, the lives of men would not be considered as so unimportant, nor sported with in the wanton manner we daily have the misfortune to see. The writer of the *Abrégé Chronologique de l'Histoire d'Espagne*, informs us, that among the Goths, “ La condition des médecins était bien triste et bien dangereuse: un médecin était en même temps chirurgien et apothécaire. *Quoique nous ne vivions pas parmi les Goths, combien ne voyons-nous pas de ces hommes qui réunissent ces trois professions, et qui n'ont d'autre talent que l'impudence et la charlatanerie: plût au ciel qu'on leur fit subir le même sort, que leurs semblables éprouvaient chez ce peuple barbare. Cet homme à toutes mains avant que d'entreprendre de guérir une maladie, convenait du prix avec le malade. Si le malade venait à mourir, le disciple d'Hipocrate perdait son salaire; s'il lui arrivait d'estropier un homme libre en*

Upon the whole I can, without hesitation, affirm, that in the West India climate, the extent of alvine evacuation need never be pushed beyond the limits which secure a free passage through the intestinal canal, and a cleansing of it at the commencement of the disease. Whatever is excited beyond this, necessarily increases the tendency to debility already too great; and, by carrying away the mercury which should accumulate till the habit is fully affected by it, must eventually deprive the patient of the only chance of recovery he probably can have. This doctrine is totally irreconcilable with what Dr. Rush relates; but it is, nevertheless, established by innumerable and incontrovertible facts. The evacuation produced by the purges employed by the Doctor, has been as immense, as its effects seem to have been happy. “In one malignant case, the most drastic purges brought away, by fifty eva-

le saignant, il était condamné à lui payer cent sols d'or d'amende (le sol valait quinze livres de France) si un homme mourait de quelque opération chirurgicale, le malheureux médecin était réduit à l'esclavage et livré aux parens du mort, qui le punissoient à leur gré, mais sans pouvoir lui ôter la vie. Si le médecin ignorant ou mal-adroit avait tué un esclave, il en était quitte pour fournir un autre esclave de la même valeur.” See Anecdotes de Médecine, tom. i. p. 63. It is curious to observe the wise distinction made between error in judgment, which may happen among *physicians*; and want of skill, which should not happen among *surgeons*.

cuations,

cuations, nothing but natural stools. The purges were continued, and finally black fæces were discharged, which produced immediate relief.”* Notwithstanding this, we are assured, in another place, that “purges are unsafe in the advanced stage of fevers;” and that he has seen death in several instances succeed a plentiful spontaneous stool in debilitated habits.” If Dr. Rush’s eulogia of bleeding and purging are compared with what he states as the consequences of mercurial salivation, in the fever of Philadelphia, we shall be inclined to think, that the former did not generally succeed, without exciting the latter; and that, therefore, we may conclude that, allowing for the greater tendency to inflammatory diathesis in the climate of Pennsylvania, his practice differed from mine, only in as much as that circumstance might have rendered necessary.

SECTION VIII.

To what Extent may Mercury be exhibited?

THE limits of safety to which mercury may be exhibited, have also given rise to much controversy: but a small share of experience, divested of prejudice, will satisfy any man that no such

* Med. Obs. and Inq. vol. iv. p. 34, and 216.

limits exist, in the diseases under consideration. Mercury, notwithstanding its powers, which have entitled it to the denomination of the “ Sampson of the Materia Medica,” is possessed of virtues which have induced an elegant medical poet to assign it a divine origin.* It is, in truth, a safe medicine, and may be given in quantities far exceeding those thought justifiable in Europe, with the best effects. The exhibition of it, however, should not be left to the discretion of unskilful persons: for the “ *ne quid nimis*” of *Sofia* is as applicable to the administration of the safest medicine, as it is to the conduct of life: and it may therefore happen, that a fatal hypercatharsis, or a too abundant salivation; may be brought on, by continuing the exhibition of mercury beyond the degree required. Let not inconsistency be imputed to me, till the explanation of this position is considered. In those cases of malignant peffilential fever, and yellow remittent, in which

* See the fable of the birth or discovery of mercury in lib. 2, of the beautiful poem, *Siphylis* of Fracastorius. Well may the inhabitants of the torrid zone sacrifice to the mother of the gods, *Ops*, from whose bowels it was derived, and in whose womb it was generated, and join her votary in the grateful exclamation, “ *Hic tibi tantorum requies inventa laborum*,” p. 115. Had Schroder omitted the exception, his observation would have been now universally confirmed by experience. “ *Imo nulla res in officinis est, si antimonium excipias, ex qua major medicamentorum supellex elici possit, quam ex mercuris.*” See Alston’s *Mat. Med.*

the danger is momentarily increasing, whilst a torpor, induced by the disease, leaves the system incapable of being acted on by mercury, until a very large quantity has been thrown in, or until the absorbent vessels are excited, by diversifying the application of it, there should be no limitation to the exhibition of the medicine. A small quantity has frequently sufficed; but I have known an instance of the yellow remittent fever, at Fort Royal, in which about 2500 grains were required to affect the salivary glands. In this case, which was that I have already mentioned, wherein the first essay upon mercurial clysters was so successfully made, the application of the medicine to absorbent surfaces was varied in every possible way; and the recovery of the patient took place in a surprizingly short time, after the ptyalitic affection of the mouth was excited. Another instance, still more extraordinary, occurred at Demerary, in the year 1799, on the plantation of Kenneth Francis Mackenzie, Esq. In the Appendix I shall detail the circumstances of the case; here I shall only observe, that before any very material change took place in the state of the patient, William Gow, he had taken 64 grains of calomel by the mouth; 34 drams, or 2040 grains were administered by clyster, and 16 ounces of the strongest mercurial ointment,

ment, or about 3600 grains of triturated mercury, were carefully rubbed into his arms and thighs; in all, 5704 grains, in the course of five days. His recovery was astonishingly rapid, after the favourable change was effected. This case was the more interesting, as the humane and ingenious gentleman, in whose service the patient was, paid a great deal of attention to the animal heat, as ascertained by the thermometer; and its increase or diminution immediately before and after the affusion of cold water, which was freely employed, in the manner directed by Dr. Currie, during the presence of the fever. In the year 1793, I considered 400 grains as an immense quantity; and, I believe, at that time, that quantity had not been exceeded. In the year 1794, I found it necessary, in some cases, to go considerably beyond 400 grains; and Mr. John Bouie, a gentleman of Grenada, constituted, in his person, the first proof of the utility, as well as safety, of limiting the exhibition of mercury in the malignant pestilential fever, only by the sensible and salutary effects it produces. In this singular case, I gave doses of 20 grains five times in the day; and at length the situation of the patient becoming truly desperate, I twice ordered 60 grains at a dose. The symptoms were alarming in the highest degree, but I felt a confidence in the mercury,

mercury, which gave me courage and resolution to persevere in it. Mr. Ferguson, the governor and gallant defender of Tobago, in 1789, and at this time collector of the customs of Grenada, who expressed and felt a very warm interest in Mr. Bouie, attended him almost as closely as I did myself. To Mr. Ferguson I uniformly returned the same answer, that if Mr. Bouie's mouth became affected by the calomel, he would certainly recover. This fortunately happened about the 9th or 10th day of the fever, after more than 800 grains of the medicine had been taken into the stomach : and Mr. Ferguson acknowledged, that the justness of the prognostic was only equalled by his astonishment at the efficacy of the remedy.

At St. Christopher's, Dr. Armstrong, after my communicating to him, in 1794, the safety and efficacy of mercury, made the most liberal use of it, and with a success little inferior to that Dr. Rush says he experienced at Philadelphia, without depletory adjuncts in any case, but in many instances with the corroborative aid of the cold bath, and other stimulating powers. At Tortola, 1100 grains have been given to a patient labouring under the malignant pestilential fever, but without effecting an increased salivary secretion, because the application of the remedy was

not

not varied as circumstances required. At Jamaica, it is said, 1600 grains have been given successfully.*

An argument not unfrequently objected to the use of mercury, in the malignant pestilential fever, and the higher grades of the remittent of hot climates, is the uncertainty of its operative effect. Thus, it is said, that a few grains, from three to ten, of this medicine, will excite a salivation in patients labouring under a venereal affection, or accidentally taken by persons in health ; whilst 1000 grains will not produce this effect in cases of these fevers ; and that, therefore, a medicine of so variable an action, should not be relied on in circumstances so dangerous. I admit the fact, because I have seen it happen ; but I deny the inference, and principally for the reasons I have already laid before the reader. It should be considered, by those who thus scrupulously avoid a practice, which they imagine is invalidated by an unapplicable fact, that the circumstances of the cases to which they refer are totally different ; that a remedy, which may possess a dangerous activity, when applied to a system unchanged by morbid causes, or affected by causes which excite an action perhaps different

* Med. Rep. vol. i. p. 499.

from that produced by putrid animal, or marsh effluvia, may, nevertheless, be almost specific in habits oppressed by the latter; that a few facts by no means justify a general conclusion; and that, as an aptitude to suffer by the action of mercury, however small the quantity exhibited may be, is extremely rare; so should it not be opposed by the multitude of facts which occur daily, and tend to prove the general existence of a different idiosyncrasy.

SECTION IX.

Does the Exhibition of Mercury prove a Preventive of the Malignant Pestilential Fever?

TO this important question I cannot give a precise answer, my information being too limited to enable me to decide. I am however inclined to think, from a few instances which have come under my observation, that it is not.

A singular circumstance is related in the fourth number of the first volume of the New York Medical Repository, on the authority of Dr. James Walker, of Jamaica, which, if founded on fact, affords grounds of belief that mercury possesses a power preventive of the action on the human body of certain morbid causes. “A circumstance

cumstance worthy of notice happened last war, at the taking of fort Omoa, on the Spanish main, which Dr. Clark, then surgeon to the Pomona frigate, on that service, communicated to me. It may be in the recollection of most of us, that a malignant fever broke out there, with the *type of a marsh fever*, which swept away great numbers of men from all the squadron, but was also so fatal on shore, that the 79th regiment alone lost eight officers. Among the ships which were captured in that harbour, one was loaded with *quicksilver*, for the use of the mines; and the vessels which contained it, being broken by the shot of the Pomona, the mercury was found floating in large quantities, and a number of men were sent on board to collect it, which they did with their hands, by throwing it into pails or buckets. *These men were continued in this employ, during all the time they remained there; and not a man of them had the smallest complaint, though surrounded by disease and death.*" The fact, thus stated, however, seems to prove no more than that the men employed in collecting the quicksilver were, during the whole time the squadron remained in the harbour of Omoa, kept unexposed to the causes of the epidemic, and consequently escaped it: they were not on shore, therefore not exposed to marsh effluvia; they were on board no other ship,

ship, therefore not exposed to contagion. It is of importance to ascertain the extent of reliance which may be placed on a reputed prophylactic; for infinite mischief may be the result of an indiscreet temerity consequent upon the imaginary possession of such. If it is true, as stated in the foregoing passage, that the particles of mercury absorbed by the hands, secured those employed from the malignant fever then raging among the rest of the soldiers and sailors; how has it happened that the same medicine taken so as to salivate, an effect which does not appear to have taken place among those collecting the quicksilver, should not, on exposition to infection, produce the same effect? The inefficacy of mercury as a prophylactic, I experienced in my own person. In the month of April, 1793, sometime after the malignant pestilential fever appeared, I was seized with a violent attack of hepatic inflammation, from which I recovered by exciting a salivation: whilst under salivation I was obliged to visit several patients labouring under the pestilence, and, having received the infection, was nearly carried off by the fever. Exciting salivation again cured me. We can account rationally enough for the curative efficacy of this medicine, after the morbid cause has begun its ravages on

the frame ; but we cannot perceive any principle on which its possession of a prophylactic power should be founded.

SECTION X.

What Preparations of Mercury are most active in the Treatment of the Malignant Pestilential, and Yellow Remittent Fevers ?

THE ease with which calomel is exhibited ; the facility with which it is possible to guard against any inordinate evacuation or spasmodic affection of the intestines it may be apt in some constitutions to produce ; have weighed more with me than the uncertainty perceived in its action on the system in some instances. These instances have indeed been so few in number, that in the general course of practice they should not constitute an objection to the preference of calomel. I have, therefore, uniformly made choice of this oxyd in preference to any other preparation of mercury. But the immensity of the danger when the curative indications are not quickly fulfilled, and the slowness of the operation of calomel, introduced by the mouth, in the instances alluded to, have induced me to
search

search for some more active preparation of this wonderful mineral. With this view I have had recourse to the mercurius calcinatus (oxidum hydrargyri per ignem); the mercurius solubilis; the strongest mercurial ointment; and have varied the application of calomel itself by introducing it immediately into the intestinal canal. I dreaded the trial of the corrosive muriate of mercury, knowing the violent effects it often produces on a stomach not already deranged by disease.

1. I brought only one ounce of calcined mercury from England with me, but that was faithfully prepared and genuine. I divided this small quantity between Dr. Davidson, of Fort Royal, and Mr. Allan, ordnance surgeon at St. Lucia, the situations where the fevers in question most prevailed. It is consequently the result of their trials I founded my opinion on, viz. that the smallness of the quantity required, and the superior activity of the medicine, render it deserving of more general exhibition in these fevers, especially as its aptitude to stimulate may more readily rouse the absorbent vessels from a state of torpor.

The experience of Dr. Davidson was confined to three cases of the malignant pestilential fever, and the following is the result: “ I have given

a trial to the *mercurius calcinatus* in three cases. In the first I began with half a grain joined to two-thirds of a grain of opium. I doubled the dose the second hour, and trebled it the third. The patient began at six in the morning, and at eight in the evening his breath had a strong mercurial smell. On the following morning every symptom was gone, and the mouth strongly affected, after taking about twenty grains. In the second no salivation was excited, but the fever left the patient. In the third no salivation was produced, but there was a remission of fever, during which the patient (a sailor) went on board his vessel, which proceeded to sea. I think one grain will be in general a sufficient dose, joined to two-thirds of a grain of opium." Mr. Allan employed it in one case only, and in that it proved successful.

2. The first information I received of the *mercurius solubilis*, is contained in the following account of it, which Mr. Christie, surgeon to his Majesty's ship the Prince of Wales, favoured me with in the month of May, 1798. Mr. Christie received a small portion of it, together with this account from Dr. Paterfon, of Green Island, Jamaica, who had it from Mr. Graham, druggist in Leadenhall Street, London. " *Mercurius solubilis* is a perfectly pure preparation of mercury :

cury: on the nicety of its preparation, indeed, very much of its efficacy depends. It is in high esteem on the continent, having been found superior in the power and certainty of its effects to calcined mercury, or any other preparation of mercury in venereal and other complaints. Its dose is a quarter of a grain increased by degrees to half a grain. One grain and a half has been found sufficient to salivate; nor, is it said, does it produce the griping usually attending on the use of the other preparations of mercury; as it is also much less dear than calcined mercury, with the above superior advantages it certainly merits attention. In England some physicians have found its good effects, and use it to the exclusion of the other mercurials." There being at that time several cases of the yellow remittent fever in the Ordnance Hospital at Fort Royal, and the circumstances of the situation of the artillery affording an expectation too well grounded of its becoming epidemic, I eagerly embraced the opportunity of putting the *mercurius solubilis* to the test of fair trial, as far as the smallness of the quantity I obtained permitted. It was exhibited in three cases of the yellow remittent fever. In one of these it was the only medicine employed; in another it was given with the oxygenated muriate of potash; and in the third with

calomel. The first and the last died ; the second recovered. In the case which terminated favourably, a large abscess formed on one of the parotids, from which an immense purulent discharge took place. Upon the whole, from this confined experience of the effects of the mercurius solubilis, I am led to attribute great powers to it ; but these powers were not exerted on the salivary glands, the usual operative effect of mercury, but in producing active hæmorrhage from the gums and hæmorrhoidal vessels. The patient to whom it was given without the addition of any other medicine, evidently sunk under the profuse discharge of blood from the gums. See the cases of Philips and Wormsley in the Appendix.

3. The mode of introducing mercury into the system by the absorbents of the skin is so slow as seldom to prove successful in these fevers ; and therefore should in no instance be entirely confided in. As a portion of mercury, however, may be thus thrown into the circulation, it will be highly proper to have recourse to friction when calomel taken into the stomach continues inactive to a dangerous length of time. Whilst the mercury is rubbed in in the usual way, it will be judicious practice, both with a view to relieve some of the distressing symptoms, such as irritability

irritability of stomach, and various local affections, as well as to expose the absorbing surface more effectually, to apply blisters, and to dress them with the strongest mercurial ointment.

4. A practice has obtained in North America of anointing the extremities with the strongest mercurial ointment in protracted cases of typhus; and the event, I am told, has been fortunate. Thus a physician of Philadelphia gives the following account of this practice to his correspondent in the West Indies. "In several very tedious cases of typhus in sailors, who were landed at the hospital of this place, I have succeeded in effecting a cure by rubbing the extremities with mercurial ointment, so as to touch the mouth, after they had taken quantities of bark and wine to no effect. They appeared to have new life when they felt the medicine affect their gums. The other stimulants then produced their wished for effect, and, with good nourishment soon effected a cure. This wonderful mineral cannot be too highly prized."

5. The mode of application which promises most success, however, when the torpor of the general system, or the irritability of the stomach, render the administration of calomel by the mouth ineffectual, is, the mercurial or calomel

clysters, so guarded with opium as to prevent much irritation, and so assisted by mechanical pressure after their injection, as to surmount the spasmodic or peristaltic exertions of the intestinal fibres to reject them. Some have already owed their lives to them; and I am confident further experience will only confirm their efficacy when other modes become impossible or doubtful.

It is pleasing to observe how much the knowledge of the efficacy, and consequently how much the use of mercury, in acute fevers, particularly the pestilential and yellow remittent, have become diffused. In the East Indies, it has long been in the highest repute. In Europe, the absurd prejudices of physicians are much done away; and the antiphlogistic powers of mercury are very generally acknowledged. In North America, the use of calomel has become almost general. The indefatigable and philanthropic exertions of Dr. Rush have been the principal cause of this extension of good among the inhabitants of the United States: and it is to be hoped that a becoming sense, universally felt, of their obligations to this excellent character, will enable him to surmount the difficulties which the arts of a malevolent opposition have thrown in his way. In all the West India Islands there is now
scarce

scarce a *dissenting voice to be heard*. A few, whose deep-rooted prejudices have been further strengthened by a pride which contemns and precludes conviction, still maintain their obstinacy, and permit their patients to sink under their vain efforts to rescue them from death, because an acknowledgment of error is, with them, a dereliction of dignity. There are also a few possessed of an apathy, which depresses their reasoning faculties; and others, of an indolence which disables them from exertion. Private practitioners of this description, however, fortunately for mankind, have only a very confined circle to act in; and if their employers are blind to their incapacity, they merit the consequence of their misplaced confidence. Where a confidence of this sort among sick is extrinsic, and more the act of necessary obedience to those who rule, and have wantonly entrusted their lives to persons thus constituted, we have to deplore the misfortune of these devoted men, and we have to imprecate the wrath of Heaven on so criminal a want of solicitude for the rights of humanity, and the interests of their country.

I shall close this chapter with my hearty concurrence with Dr. Reynolds, of the state of New York. "Let those who condemn this practice consider

consider that the *materia medica* furnishes nothing that will so effectually open all the secretions at once as mercury. From thence I think the conclusion is easy, that nothing will so speedily discharge from the circulation whatever matter may happen to be present, as this divine medicine.”*

* Webster's Collection of Papers on the Subject of Bilious Fevers, p. 199.

CHAPTER V.

On the Use of Oxygenated Medicines, more especially the Nitrous Acid and Oxygenated Muriate of Potash, in the Yellow and Simple Remittent Fevers; Diseases depending on Visceral Derangement; the Lues Venerea; and the Yaws.

DR. CULLEN observed that there is only one sedative power which may be supposed to continue to act for a long time after its first application, and that is contagion; but that we know nothing of the nature of contagion that can lead us to any measures for removing or correcting it.* To this Dr. Thornton's remark may probably be considered as a fair answer. "It seems reserved," says that ingenious physician, "for the honour of the present enlightened age to discover a scientific and successful method of treating putrid fever. The contagion has been represented as a stimulus exhausting the irritability of the system, which depends upon the oxygen in the blood; and a method of cure hypo-

* First Lines, Part 1. c. 6. f. 1.

thetically deduced was to supply this as fast as it was consumed by the excessive and morbid stimulus. You justly reprobate the common practice of drenching patients labouring under typhus with wine and opiates, until they are not uncommonly stimulated to death. Our chief aim should be to restore the principle of excitability; and stimulants should in the mean time be exhibited with a more sparing hand."* This is the practice I have endeavoured to recommend, and which I trust has obtained such stability from the almost universal experience of its efficacy, as will secure its prevalence and permanency. But the introduction of oxygen into the system by any other means than the oxyds of mercury has hitherto, within the tropics, been unattempted; nor should I have judged it expedient to have recourse to other oxygenated medicines, had I not seen, in the same valuable work, in which Dr. Thornton's letter is published, a singular instance of the advantages which may be obtained from saturating the system with pure uncombined oxygenous gas, in a protracted case of malignant pestilential fever. This case, so perspicuously related by Mr. Kentish, may be considered as a suspension of the action of the

* Beddoes's Considerations on Facitious Acids, &c. Part iv. p. 135.

remote cause of that pestilence, in which restoring the salutary proportion of oxygen and azote, cured the patient. This very instructive case first suggested to me the advantages which might be expected from the introduction of pure oxygen into the system, in the treatment of the malignant pestilential and yellow remittent fevers; and constitutes an irrefragable proof of the justness of Dr. Thornton's remark.

I have made an attempt, in the first part of this work, to elucidate the nature of the remote cause of the malignant pestilential, and yellow remittent fevers; and to shew that a chemical combination of oxygen and azote probably constitutes that of the former; and that a similar combination of hydrogen, with some other principle, that of the latter. How far the theory is just must depend on future research; but the discovery of the utility of oxygenating the system in cases of these fevers, must be allowed to do much towards the establishment of it: for we can readily conceive, that the destruction of such deleterious combinations may be effected by a competent and suitable addition of oxygen. In fact, theory and practice, in this instance, seem reciprocally to illustrate each other. It may be objected, however, that the proportions of oxygen and azote entering into the composition of
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the atmosphere of temperate and cold climates, not obtaining in that of hot, it follows that some difference must result in the combination of these fluids which, we suppose, constitutes the remote cause of contagious fevers—but as morbid fluids are known to float in the atmosphere without being affected by it, so may we admit that the super-oxygenation of the atmosphere of the torrid zone does not operate any change on that in question, further than perhaps limiting its diffusion to a radius not exceeding ten feet.* Having this theory in view, we can explain, on rational principles, the phænomena of contagious and pestilential fevers; and the curative effect of mercury and other oxygenated medicines: we perceive why the oxygenation of the system in all cases of disease which depend on contagion, or in which particular organs are affected by a peculiar inflammatory diathesis, produces a salutary resolution: nor do we find difficulty in accounting for a similar effect taking place, from the same process in fevers, whose cause may be conceived to be a combination of hydrogen with some other pernicious principle. Much has been done by Dr. Beddoes, and other ingenious physicians, by the application of this remedy to diseases depending on these principles in Europe.

* See note to page 302.

Hitherto, however, the advantages derived from this practice have been confined to cold climates, nor have the physicians of the torrid zone contemplated them in any other view, than as a beautiful speculation, capable of amusing the fancy, but inadmissible in actual medical practice. Mercury has indeed been almost universally applied to diseases of infection, and to such as depend on a peculiar inflammatory diathesis; but the principle from which its curative operation arises, has been imperfectly, or not at all, understood.

Impressed with an opinion that medicines containing oxygen would impart this fluid when received into the system, and produce effects similar to those they had been found to occasion in Europe, when used within the tropics, I anxiously wished for the possession of them, properly prepared, to put them to the test of experience. It was not, however, till the month of March, 1798, I had this in my power. About that period I was enabled to go a great way towards the establishment of this important point, by the assistance of my friend Dr. Rollo, Surgeon General to the Royal Artillery at Woolwich. From Dr. Rollo I received a sufficient quantity of genuine and faithfully prepared nitrous acid, and oxygenated muriate of potash, to institute an enquiry

enquiry relative to the medical powers of pure oxygenous gas in the diseases of hot climates, more especially the yellow remittent fever. Simple remittents, hepatic affections, dyspeptic cases, in a word, all visceral obstructions and diseases depending on them. As no case of the malignant pestilential fever occurred, I, of course, had no opportunity of ascertaining their power in the cure of that dreadful malady; but there is too much room to believe, from the trials made in the yellow remittent fever, that the progress of the disease is too rapid, and the symptoms too violent to be arrested by their agency. The valuable assistance of Dr. Davidson, who had the immediate care of the sick in the Ordnance Hospital at Fort Royal, principally contributed to the success of the trials made of these medicines.

In the course of the month of April only two cases of simple remittent fever, but many of obstruction or inflammation of the abdominal viscera, were admitted into the Ordnance Hospital. One of the former was cautiously treated with the oxygenated muriate of potash; and almost all the latter, which were rather chronic than acute, were treated in the manner recommended by Mr. Scott, with the nitrous acid. There was one singular case (Appendix 3d. case 6th.) of enlarged spleen, and dropical swelling of the abdomen

domen with hydrocele. In this the nitrous acid, in any state of dilution, could not be made to sit on the stomach; and therefore the oxygenated muriate of potash was substituted, in doses of four grains only, repeated every four hours. This medicine, thus exhibited, on the third day, produced so remarkable a whiteness of the tongue, as to excite the astonishment of even the attendants; and within a week the secretion of urine was considerably increased, and the swelling of the abdomen almost entirely reduced. The ordinance surgeon had it in view to effect a cure of the hydrocele, which was of a year's standing, by the injection of diluted wine, but the oxygenated muriate, by creating an absorption of the fluid, disappointed him, and completed the cure. The invariable success attending these first trials, encouraged a further prosecution of them; and even their application to fevers of a more violent action than the simple remittent. The months of May, June, and July, furnished many opportunities of putting their efficacy to the test of experience. Many cases of the yellow remittent fever were received into the hospital; and as far as prudence, and our limited acquaintance with the powers of the oxygenated medicines in our possession, authorised us to proceed, very fair trials were made in that obdurate disease, as well

as in the simple remittents, and hepatic affections. In the two latter, we uniformly experienced the same happy result; but in the former, our success was limited indeed, although the exhibition of the oxygenated muriate of potash was extended to a great length, very early recurred to, modified according to circumstances, and alternated or combined with mercury. The result of the exhibition of this medicine in yellow remittent fever appeared to be, that, 1st, without combination with any other medicine—2d, preceded by blood-letting—3d, combined with calomel, and both seconded by cold bathing—the patients, without exception, died: and that, 1st, combined with soluble mercury—2d, followed up by calomel, a cure was effected. The only case of yellow remittent fever in which the nitrous acid was exhibited, terminated fatally. (See Appendix 2d, Case 17th.) The effects were dreadful; a most violent spasm of the stomach was instantly produced, although no irritability of that organ existed before; and no application whatever afterwards could remove it. A repetition was consequently carefully avoided. Such a result, compared with that of the exhibition of calomel, regulated in the manner I have already described, warranted no further trials of the oxygenated muriate of potash, or nitrous acid; and, therefore,

fore, we placed our whole confidence in a medicine which, properly managed, had feldom disappointed us.

I may observe, whilst on this subject, although foreign to the general object of the work, that the nitrous acid has fully justified the very high character given of it by Mr. Scott in the cure of hepatic affections; in anasarous and ascitic swellings resulting from morbid derangements of the abdominal viscera; in dyspeptic affections; in lues venerea; in cutaneous affections, and particularly in yaws. The cases of venereal affections, and of yaws, were not numerous; but the effect was sufficiently conspicuous to ascertain the excellence of the medicine.

Upon the whole, the general result of the trials of the nitrous acid and oxygenated muriate of potash, instituted in the Ordnance Hospital at Fort Royal, is the following:—

1. The nitrous acid is a most safe and efficacious medicine in hepatic complaints of an old standing; in all visceral obstructions and diseases depending on them; in obstinate and old cases of venereal affection; in cutaneous diseases; and in the yaws.*

2. The

* I have understood that the use of the nitrous acid has, in a few instances, found its way into the practice of the French physicians.

2. The oxygenated muriate of potash has cured in every instance of simple bilious remittent fever, with expedition and safety; in hepatic affections; and in general in the same diseases in which the nitrous acid has proved successful, except, perhaps, the venereal and cutaneous affections.

3. Neither of them, but more especially the nitrous acid, can, in the smallest degree, be depended on in the yellow remittent fever.

An ingenious medical gentleman of Dominica, Dr. William Bremner, who had instituted some trials of the oxygenated medicines at my request, favoured me with the result in two cases of venereal affection. "In a case of chancre in the penis of ten days standing, and for which no medicine had been used, the oxygenated muriate of potash was given to the extent of three grains

cians. It has been introduced into Martinico from France through the medium of emigrant French practitioners settled at New York. My information is very imperfect, but I have reason to believe it has been used by a French practitioner of Fort Royal, in leprosy, and in pulmonary consumption, with considerable advantage. The knowledge of the general utility of this remedy acquired by a person in France, induced him to demand from the National Convention a reward for the discovery of an universal remedy; but to derive every possible advantage from it, he also demanded that it should be kept secret. The philanthropic communication of Mr. Scott has happily rendered abortive this attempt to monopolize a general good.

twice a day. It produced no sensible effect at first; but the patient had not used it above a week, when *a copious salivation* came on, the ulcer healed up, and the patient has continued well since. In another case of lues venerea, attended with ulceration of the throat, nocturnal pains, &c. and for which repeated courses of mercury had been employed without benefit, it was tried as in the former case, and continued for nearly three weeks. It did not produce salivation, but the ulcers in the throat gradually healed up." It does not appear, however, that the dose here used was by any means sufficient, as the ulcers again broke out. But the efficacy of the oxygenated muriate of potash, as I have already observed, is far from conspicuous in venereal diseases; and Dr. Bremner has illustrated this, by two cases of considerable inveteracy, in which this medicine produced no effect, although the dose was raised to twelve grains.

The operative effects of the oxygenated muriate of potash, are frequently not obvious. When, however, these effects are evident, the pulse, the tongue, the gums and palate, the palms of the hands, the urinary secretion, and the blood, are most affected by it.

The pulse becomes less frequent, and its fullness is diminished. This effect in remittent fe-

vers takes place generally after twenty or thirty grains of the medicine are taken : and it is singular that an increased dose, that is ten grains, does not seem to produce this change, by any means, so effectually, as one of four or six repeated every four hours. The mouth is affected by the oxygenated muriate, in many cases, in a very singular manner. The edges of the tongue are only slightly affected ; but the superior surface has often a large clean sore, or rather excoriation upon it, corresponding, generally, to another on the palate : the gums seem raw, or of a florid redness ; and no smell, such as that accompanying a mercurial ptyalism, is ever observed. When no excoriation or ulceration happens, there is always a remarkable whiteness of the tongue, with a faint blue list running the whole length on each side. This appearance resembles so much that of the tongue, which I have constantly observed in the species of atrophy, peculiar, in some measure, to negroes, called the *mal d'estomac*, as to give rise to a suspicion that that disease proceeds from an hyper-oxygenation of the system ; a suspicion raised almost to certainty by the efficacy of animal food in diet, and of the sulphate of copper as a medicine, in the treatment of it. These changes in the mouth are generally accompanied with a sense of uneasiness at the articulation

culation of the jaws; a fulness or tension of the whole head; and a heat and prickling of the palms of the hands. The secretion of urine is prodigiously increased, but I have not remarked any peculiarity in the state of that fluid. It has, indeed, in remittent fever, and in hepatic affections, been deeply tinged with a yellowish or brownish colour; but, probably, the peculiar morbid state of the system might have given rise to it. The discharge is unaccompanied with any uneasiness; but its increase is generally remarkably sudden. A very large dose, twenty grains, produces a most singular sensation at the stomach, such as what we may conceive proceeds from constriction or corrugation of its fibres. Blood after the exhibition of the oxygenated muriate was remarkably florid and somewhat fizy. This was observed in two cases, wherein blood was drawn with a view to ascertain the change produced on it by the medicine.

These effects of the oxygenated muriate are perceived at the expiration of twelve or twenty-four hours, when the patient is sensibly relieved of all his symptoms. The termination of the disease, which soon after follows, seems evidently to be brought about by a deposition of the morbid matter on the tongue and kidneys.

A singular fact occurs in the course of the ex-

hibition of the oxygenated medicines, particularly the oxygenated muriate of potash, in diseases of a febrile character, or such as depend on visceral obstruction. When the oxygenated muriate has been given to a considerable extent without any evident effect resulting from it, the exhibition of mercury has produced a sudden and salutary change. The same also happens when the course of these medicines has been reversed; for when mercury has been thrown in in large quantity, but remains inactive, the substitution or alternation of the oxygenated muriate, is very soon followed by a cure, and not unfrequently without any affection of the salivary glands. The oxygenated muriate has been often observed to produce a concentration of, or to give an activity to local inflammation, in such anomalous cases, as elude the penetration of the physician. In such obscure cases, the medicine seems to detect both the nature and seat of the disease; and a slight depletion by bleeding or blistering, or both, immediately succeeded by a mercurial, secures a cure. Or, if this should happen in cases of this character, wherein great debility has already been produced by morbid action, the stimulus of mercury should be followed up by the further exhibition of the oxygenated muriate. (Appendix 3d, Case 15th).

The operative effects of the nitrous acid, are confined to the tongue, gums, kidneys, and salivary glands. The tongue assumes a whiteness, but not in so remarkable degree, as from the oxygenated muriate : but, more generally, it is covered with a thick fur, of a light greenish colour in the center, which deepens towards the edges into a dark shade ; and the edges are of a bright red or florid. The gums become florid and swelled ; and symptoms of ptyalism are brought on, such as are excited by mercury ; the whole head is affected by a tension and fulness ; the articulation of the jaws becomes painful ; the teeth are loose ; and saliva flows into the mouth in abundance, proportioned to the quantity of the medicine exhibited. The only distinctions perceptible between salivation excited by the nitrous acid, and that by mercury, are the peculiar fetor attending the latter, not produced by the former ; and the former ceasing very soon after the exhibition of the medicine is discontinued. It is with some degree of astonishment, therefore, I find Mr. Cruickshank did not perceive any ptyalitic affection from the exhibition of the nitrous acid ; and that he attributes this effect to a mistake arising from confounding the local and temporary soreness in the gums and teeth, occasioned by the acid, with the inflammation

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and ulceration produced by mercury.* As the observation of this effect of the nitrous acid was made by many others as well as myself, and as there

* Dr. Rollo, on Diabetes Mellitus, 2d Ed. p. 520.—In Dr. Beddoes' reports concerning the effects of the nitrous acid in the venereal disease, it appears that Mr. Hammick, and Dr. Geach, of Plymouth, also found it dispossessed of action on the salivary glands in fifty cases of venereal affection, wherein it was employed with success. Dr. Girdlestone, of Yarmouth, found that although this medicine, exhibited alone in venereal affections, generally produced a copious flow of saliva, with tenderness and swelling of the gums, it seemed rather to increase the disease; but that by then substituting mercurial frictions, the cure was rapidly effected. This result corresponds most exactly with my experience; and seems to constitute an additional confirmation of the opinion I have stated respecting the mode of operation of mercury in the system. Dr. Rutherford has experienced various events from the exhibition of nitrous acid in venereal complaints; but his success seems to have been uniform when this and mercury were combined, or given at the same time: a further proof of the necessity in most cases of employing the stimulation of mercury to fix and give determination to oxygene. The ptyalitic effect of nitrous acid is recorded by Mr. Kellie, surgeon of the Leopard, to have taken place in three out of four cases. *Annals of Medicine*, vol. ii. p. 214 and 254. I have only seen a general account of Mr. Blair's Essays on this interesting subject; but the result of his trials of the nitrous acid, and oxygenated muriate of potash, gives little encouragement to proceed in the use of them. The quere remains still, however, to be answered. Did not the exhibition of these oxygenated medicines facilitate the action of mercury? It may be further enquired whether the alternation of the nitrous acid, or oxygenated muriate of potash, with mercury, might not have rendered the exhibition of 289 drams of the acid in one case, and of 76 of the muriate in another, unnecessary. *Med. and Chirurg. Review*, Sept. 1798. Mr. Cruickshank,
from

there was scarce any instance of its exhibition unattended by salivation, I think the fact may be depended on. I also experienced this effect in my own person, having had occasion to make use of the medicine for chronic hepatic affection; so that I consider the relation of the operative effects of nitrous acid given by Mr. Scott, as fully confirmed. Has a hot climate any power of determining the action of this medicine to the salivary glands? On creating a discharge of ferous fluid from any part of the body, by a blister, the salivation excited by the nitrous acid ceases; nor does it return when the blistered surface is healed, unless the exhibition of the acid is renewed. The increased secretion of urine is not so obvious an effect of nitrous acid as of the oxygenated

from numerous and reiterated trials, has formed a very different opinion. "We shall conclude these remarks, says he, with observing, that one of the two following positions must be admitted: Either these remedies cure the lues venerea, or, in 99 cases out of 100, the disease cures itself. Our opponents may take which side they choose; for on either supposition, mercury must be unnecessary; and this is our principal object." Rollo, on Diab. Mellit. 2d Ed. p. 625. The efficacy of oxygenating the system in venereal cases has also been testified by M. Alyon, who derived his first hints from the opinion of Fourcroy, whose pupil he was. Many of Alyon's observations will be perceived to correspond with those which occurred to me. He also, with Fourcroy, considers the action of mercury as depending on its oxygene. See Annals of Medicine for 1798, p. 266—276.

muriate of potash ; although it does take place to a considerable extent in some cases. It often irritates the stomach and bowels ; and in cases where these are subject to spasm or irritation, it is undoubtedly an unsafe medicine. The continued use of the nitrous acid has produced, in some instances, an eruption, resembling the prickly heat, and in almost all, a flushing of the face ; a strong and quickened pulse ; an uncommon clearness and vivacity of the eye ; a tightness of the chest ; a difficult respiration, and a short troublesome cough ; a considerable pain in the region of the liver ; and headach ; and blood drawn in such cases is very florid and fizy. These signs of super-oxygenation are of short duration, and vanish on discontinuing the medicine.

The dose of nitrous acid sufficient to produce its operative effects, varies from half a dram to three drams diluted in water, in the twenty-four hours ; and the best method of administering it, is to increase the dose gradually ; for the stomach and bowels being extremely apt to suffer by it, it is necessary to habituate them cautiously to its action. It is obvious that it must be for this reason that the medicine is generally inadmissible in acute diseases, and which have a rapid course. The period too at which these effects take place, varies : but generally a favourable change is perceived

ceived about the eighth or tenth day of exhibition, and the cure effected about the 13th or 16th. Cases have occurred, however, in which the disease has been removed before the expiration of a week.

Venereal affections and the yaws have required a much longer and more liberal administration of the nitrous acid. All the cases of the former, which have been treated with it, have been of an old standing, and had repeatedly resisted the action of mercury. The disease has been removed in these at periods between the 14th and 36th day of exhibition. The first case of the latter was singular, from the subject of it being a foldier of the Irish artillery just arrived in the West Indies; from its having been communicated to him by another foldier at Hilsea barracks, who had been infected in the West Indies; and from no medicine whatever having been employed before for the cure of the disease. In this case the yawy excrescences fell off as the oxygenation of the system proceeded; and the cure was completed in about six weeks of exhibition. All those signs of super-oxygenation I have mentioned occurred towards the close of the exhibition of the nitrous acid. Since this proof of the efficacy of the nitrous acid in the yaws, trials of it have been made in several instances, by Dr.

Davidson,

Davidson, of Fort Royal, by Dr. Harries of St. Vincent, and other practitioners, and with the same happy event.

The consideration of these facts, and comparing them with the phænomena which the exhibition of mercury, in the same diseases, gives rise to, confirm us in the belief that oxygene is common to both. There are, however, qualities possessed by mercury, which are evidently peculiar, and communicate to it a degree of appropriate energy, which secures an efficacy the other oxygenated medicines are incapable of. What these qualities are, I cannot take upon me to say. It is probable, however, that although the nitrous acid, and the oxygenated muriate of potash, disengage a considerable quantity of oxygene, they possess little more power in cases of violent morbid action; and that, therefore, the oxygene accumulates, without being determined to the parts of the body chiefly diseased. We may, therefore, in such cases, consider oxygene as accumulated in the system, like the electric fluid, and which displays its action only when called forth by some conductor, such as mercury. Certainly cases have fallen under my observation which seem to give stability to the conjecture: and the only favourable terminations in the yellow remittent fever which took place, when the exhibition

exhibition of the oxygenated muriate of potash was employed, were produced by following up that medicine by a mercurial oxyd. It was obvious to me, in these cases, that the oxygenated muriate of potash, and the mercurial oxyd, excited a curative effect, which the former alone had not power to produce. Thus, until a stimulus is induced, the disengaged oxygene accumulates and floats in the system, but is incapable of determination or fixation. Further observation is necessary to establish this opinion.

In diseases of weaker action, it is admitted that health may be restored, by the nitrous acid and oxygenated muriate of potash, without the assistance of mercury; because in these more time is given for the saturation of the system; and the superabundance becomes a sufficient stimulus of itself, to give determination to the oxygene. In this manner I imagine its efficacy may be accounted for; for in such cases, if mercury succeeds the exhibition of these oxygenated medicines, to a certain extent, the cure is very much more rapid.

The *modus operandi* of oxygene disengaged from all these medicines in the system, has been well explained by Mr. Cruickshank; but whilst I admit with him that it cures by exciting a new action, in consequence of which the morbid one,
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whatever it may be, is suspended ; I am inclined to go further, and to believe that the absorbent vessels are stimulated to take up the poison which constitutes the basis of the cause of the disease, and to throw it off either by the salivary glands, or the kidneys. This is a phænomenon perceptible from the action of the oxygenated muriate of potash, in particular, which seems to establish this opinion. If it is exhibited for the resolution of topical congestions, it seems gradually to concentrate and augment the inflammatory state of the diseased organ, immediately before it resolves it. In this we may conceive the commencement of absorption, and cessation of determination or deposition of morbid matter. This struggle between congestion and absorption is sometimes so considerable, as to require the mediating influence of bleeding. This is more particularly observable in chronic hepatitis, and in chronic topical inflammations of an equivocal or anomalous nature ; but it is not peculiar to such ; for in remittent fevers, which generally depend on obscure hepatic congestions, a similar, but less conspicuous phænomenon may be remarked. Without the absorption and consequent expulsion of the morbid matter or cause, we cannot conceive the perfect accomplishment of cure : for the instant the new action, induced by the medicine

dicine, ceases to operate, the suspended action of the morbid cause will be renewed: nor does the ingenious idea of the renewal of excitability, and the habituation of the system to its natural and healthy movements, whereby it acquires a power of resisting morbid action, assist us much in the solution of the difficulty, without the admission, at the same time, of absorption and expulsion. In fact, as the abstraction of the remote cause has always been the great principle on which physicians have founded their hopes of obviating disease; so, in the present instance, does the cure depend on the absorption and expulsion of the fomes of the disease, for which the exhibition of oxygenated medicines is employed.

CONCLUSION.

BEFORE I conclude this part of the task I have imposed on myself, I cannot help observing, that as the majority of the most useful part of society are daily exposed to the ravages of two of the most destructive calamities mankind are subject to, we have reason to consider ourselves as extremely fortunate in possessing a remedy which, under certain circumstances, may be depended on in the cure of them. There is no doubt the influence of old habits, and medical authority are to be

combated, ere the practice I have recommended can be generally adopted; but it is to be hoped that these will yield to facts and experience, the physician's only certain guides in the treatment of disease. Little encouragement is held out by the result of the practice hitherto generally resorted to in malignant and pestilential fevers; but, authorized by men highly eminent in their profession, it has become a kind of false beacon, directing the young and inexperienced to measures full of inconceivable mischief. An instance or two will illustrate this: Dr. Schotte, in his very ingenious treatise on a contagious fever which raged fatally at Senegal, observes, that "he did not think himself very blameable in not administering laudanum sooner; for what can a young practitioner do better, than follow the rules and precepts laid down by celebrated clinical authors." "Opium I was prevented from giving, by those cautions which are met with in the writings of many eminent authors, as preventing nature in its operations, and putting a stop to its salutary intentions."* How much is it to be regretted that Dr. Schotte, in so melancholy an extremity, forgot that he practised within the torrid zone, where, cautions necessary, perhaps, in London

* Treatise on the Synochus Atrabiliosa, p. 139, 140.

and its neighbourhood, are not admissible ! How much mischief might have been prevented, had his judgment been unshakled ; had he boldly, on an occasion, which demanded new and decisive measures, thought for himself ; had he investigated more fully, more especially by dissection, the nature of the disease he treated ; had he known, or adverted to the antiphlogistic virtues of mercury, and the infinite advantage arising from the promoting of absorption in a disease so evidently depending on local derangement ! The treatment of the plague, as conducted at Aleppo at least, furnishes another instance fully as much in point. The means related by Dr. Ruffel seem evidently to have been inapplicable, in most instances, and in all unequal, to the subjugation of that hitherto almost incurable malady. It cannot, therefore, excite our wonder that the proportion of mortality should have been so immensely great. We are told that all of the 1st, 2d, and 3d classes, and one-half of the 4th and 6th perished ; and that the 5th, which comprehended such slight cases as probably required no medical assistance, was the only one in which mortality had no place. In a disease of so terrible a nature, what could be expected from mild evacuants, mild or doubtful diaphoretics, medi-

cated cordials, and occasional bleeding. To such feeble practice, Dr. Ruffel was obliged to confine himself; for “certain popular prejudices prevalent in Turkey, lay restraints on the medical practice in the plague, and sometimes leave little more to the physician than to remain a passive spectator of the natural progress of the disease.”*

It is to be lamented, however, that the enlightened practitioner did not attempt to avail himself of those justifiable deceptions which betray the patient into the use of salutary and appropriate remedies. There is, from a review of the phænomena of the plague, and from the consideration of the applicability of the foregoing reasoning to them, in respect to the nature of the cause, to the indications of cure, and to the means of fulfilling them, a reasonable expectation presented, that a similar mode of treatment, would have been, if adopted, crowned with similar success.

As a physician offers himself to the public as the declared enemy of disease, in every form it may assume; as he consequently pledges himself to leave nought undone which he knows can, or which promises to be useful towards the ob-

* Treatise on the Plague, p. 96—112, and 143—166.

tainment of the object in view ; is it not incumbent on him, as a preliminary step, by every possible means to discover the nature of the malady he is to encounter ; and even should there be danger in the attempt, does it not display a most unpardonable timidity, a medical lâcheté stamped with characters uncommonly prominent, should he shrink from it, when life is the object to be obtained ? When this species of culpability proceeds from prejudice in favour of preconceived theories, or from doctrines taught, it is heightened manifold. How noble were the sentiments of Dr. Priestly in his respect : In acknowledging his having fallen into this error, with respect to M. Lavoisier's discoveries, he thus forcibly expresses himself : “ That I did not perceive the truth in this instance, I attribute to the force of prejudice, which, unknown to ourselves, biases not only our judgments, properly so called, but even the perceptions of our senses ; for we may take a maxim so strongly for granted, that the plainest evidence of sense will not entirely change, and often hardly modify, our persuasions ; and the more ingenious a man is, the more effectually he is entangled in his errors ; his ingenuity only helping him to deceive himself, by evading the force of truth.” It is a physician's duty to do
every

every thing in his power, that is not criminal, to save the life of his patient : and to use a plain and rather trite simile, an able physician, like a skilful general, should inform himself fully of the number, the strong-holds, the advantageous positions, the vulnerable points of the enemy, before he seriously attacks. Thus prepared, his enemy falls before him, because he knows where to direct his force with superior advantage. In short, to apply to the present purpose the elegant but terse language of Dr. Moore, “ He who derives his medical knowledge from books alone, and whose exalted notions have not been moderated by experience, will practise medicine as the philosopher who declaimed on the art of war to Hannibal, would have commanded an army ; he who has seen much practice without reasoning, as one of Hannibal’s pioneers ; and he who joins the greatest natural acuteness, and all the powers of reasoning, as Hannibal himself.”* It must be confessed, however, that the part a young practitioner has to act in hot climates is extremely difficult, where, to use the words of an ingenious and amiable writer, on another occasion, “ diseases are found complicated in endless varieties ;

* Medical Sketches, p. 59.

which occasions an embarrassment which nothing can remove, but a habit of nice discernment, a quickness of apprehension which enables him to perceive *real analogies*; and what is rarely united with this, a solidity of judgment, which secures him from being deceived by *imaginary ones*.”*

* Lectures on the Duties of a Physician, p. 15.

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